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NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

NATIONAL IMPERATIVE TO ESTABLISH A DOMESTIC MEDICAL INTELLIGENCE CENTER

by

Nitin Natarajan

September 2007

Thesis Advisor:	Robert Simeral
Thesis Co-Advisor:	Anke Richter

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REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters, Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.			
1. AGENCY USE ONLY *(Leave blank)*	**2. REPORT DATE** September 2007	**3. REPORT TYPE AND DATES COVERED** Master's Thesis	
4. TITLE AND SUBTITLE National Imperative to Establish a Domestic Medical Intelligence Center		**5. FUNDING NUMBERS**	
6. AUTHOR(S) Nitin Natarajan			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Postgraduate School Monterey, CA 93943-5000		**8. PERFORMING ORGANIZATION REPORT NUMBER**	
9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES) N/A		**10. SPONSORING/MONITORING AGENCY REPORT NUMBER**	
11. SUPPLEMENTARY NOTES The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.			
12a. DISTRIBUTION / AVAILABILITY STATEMENT Approved for public release; distribution is unlimited		**12b. DISTRIBUTION CODE** A	

13. ABSTRACT (maximum 200 words)

The United States does not have a centralized organization tasked with the oversight or implementation of a domestic medical intelligence program. Organizations throughout the nation have adopted a variety of definitions and operating procedures related to medical intelligence; however, they are inconsistent. Additionally, most jurisdictions limit medical intelligence to epidemiological surveillance.

This thesis will propose the structure, governmental organization, data sets, and reporting for a domestic medical intelligence center. This center will require close partnership with other federal agencies and state, local, tribal, and territorial (SLTT) governments. In addition, this thesis will analyze medical intelligence operations within the Armed Forces Medical Intelligence Center, the Department of Homeland Security Office of Health Affairs, the Metropolitan Washington Fusion Center, and the Los Angeles Terrorism Early Warning Group.

As this thesis shows, the development of a domestic medical intelligence center, covering a wide range of data sets, will allow for the effective collection, integration, analysis, and dissemination of both tactical and strategic actionable intelligence for federal and SLTT governments and private sector partners. These actions will assist in addressing this significant gap and increasing our nation's level of preparedness thereby improving our nation's response to large scale incidents, both naturally occurring and man-made.

14. SUBJECT TERMS Intelligence, Public Health, Medical Intelligence, Domestic Medical Intelligence, Fusion Center, Information Sharing, Data Collection,			**15. NUMBER OF PAGES** 103
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	**18. SECURITY CLASSIFICATION OF THIS PAGE** Unclassified	**19. SECURITY CLASSIFICATION OF ABSTRACT** Unclassified	**20. LIMITATION OF ABSTRACT** UU

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)
Prescribed by ANSI Std. 239-18

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NATIONAL IMPERATIVE TO ESTABLISH A DOMESTIC MEDICAL INTELLIGENCE CENTER

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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF ARTS IN SECURITY STUDIES
(HOMELAND SECURITY AND DEFENSE)

from the

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ABSTRACT

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This thesis will propose the structure, governmental organization, data sets, and reporting for a domestic medical intelligence center. This center will require close partnership with other federal agencies and state, local, tribal, and territorial (SLTT) governments. In addition, this thesis will analyze medical intelligence operations within the Armed Forces Medical Intelligence Center, the Department of Homeland Security Office of Health Affairs, the Metropolitan Washington Fusion Center, and the Los Angeles Terrorism Early Warning Group.

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EXECUTIVE SUMMARY

Department of Defense Joint Publication 1-02 defines medical intelligence (MEDINT) as "that category of intelligence resulting from collection, evaluation, analysis, and interpretation of foreign medical, bio-scientific, and environmental information that is of interest to strategic planning and to military medical planning and operations for the conservation of the fighting strength of friendly forces and the formation of assessments of foreign medical capabilities in both military and civilian sectors." While an effective definition for the Department of Defense, this does not address all the needs of the essential and emerging field of domestic medical intelligence. I propose that we define domestic medical intelligence as that category of intelligence resulting from the collection, integration, analysis, and dissemination of natural and man-made psychological, chemical, biological, radiological, environmental, and agricultural information with a public health and health care focus that may influence the day-to-day activities or national security of the nation or national assets.

I posit that there is a significant gap in existing domestic medical intelligence operations and that the development of a nationwide domestic medical intelligence center will help address that void.

The United States currently does not have a centralized organization tasked with the analysis of medical intelligence from throughout the United States. In addition, current intelligence fusion centers run the spectrum from no medical intelligence operations to well developed and integrated medical intelligence operations. Unfortunately, there are no set standards on what data is collected, analyzed, or disseminated. The development of a domestic medical intelligence center is critical to the effective collection, integration, analysis, and dissemination of domestic medical intelligence data.

This thesis will examine more than 100 different data points currently collected throughout almost 20 agencies or administrations that need to be integrated into one central domestic medical intelligence center. This effort should begin with the

development of a national domestic medical intelligence center, managed by the Department of Homeland Security with close collaboration with a number of other agencies, including the Department of Health and Human Services and its various operational divisions, and state, local, tribal, and territorial governments. Much of the data already is being collected on a local, state, or federal level; however, there is no central analysis.

As we move toward establishing such a system, we must ensure that all parties involved, including the general public, are informed of the methods of collection and dissemination, and that compliance with all pertinent federal and state laws is maintained throughout the operation. In many cases, the federal government will not be the holder of raw data; however, it will receive aggregate, blinded data from state and local governments. In these cases, communication among the federal, state, and local governments will be critical in the event that contact must be made with the patient.

Once developed, this center will allow for the effective collection, integration, analysis, and dissemination of both tactical and strategic actionable intelligence for federal, state, local, tribal, and territorial governments and private sector partners. These actions will assist in increasing our nation's level of preparedness and improve our nation's response to large scale incidents, both naturally occurring and man-made.

ACKNOWLEDGMENTS

This thesis would not be possible without the time, assistance, and support of a many individuals. From the creators of this program to the professors, administrators, evaluators, and library professionals who continue to hone and refine the program, it would not be the same without each of you. Your professionalism and dedication to educating tomorrow's homeland security leaders is second to none.

I also thank Robert Simeral and Anke Richter for their valuable insight and advice throughout the thesis process. Their expertise and guidance allowed me to take my concept from a thought to what it is today.

My participation in the program would not be possible without the support of the District of Columbia Department of Health and specifically its Director, Dr. Gregg Pane, and Senior Deputy Director, Beverly Pritchett.

Last, and definitely not least, I thank my family. To my wife, Elizabeth, who held down the home front with a newborn baby and toddler at home while I attended the program, a simple thank you does not do justice. To my son, Kiran and daughter Sonia, your support and understanding of my extended absences during your first few years of life never will be forgotten.

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I. INTRODUCTION

A. PROBLEM STATEMENT

The concept of a medical intelligence center or a central collection point for such intelligence is not new. The Department of Defense has been running the Armed Forces Medical Intelligence Center (AFMIC) for a number of years. AFMIC collects a significant amount of medical intelligence on nations outside of the United States. Data include various health and medical threats that personnel may face, clinical and research-based medical capabilities, such as hospital capabilities and assorted research and developmental data, and recommended courses of action. These data are extremely valuable to both medical and non-medical personnel and has an impact prior to, during, and after deployment. Executive Order 12333 refers to the Department of Defense's authority to collect foreign and military intelligence; however, it does not address the ability or assign responsibility for the collection of intelligence within the United States. Moreover, the field, and even concept, of medical intelligence is not well understood outside of military circles. In the civilian sector, medical intelligence typically is interpreted to mean epidemiological data. A majority of the literature within clinical and academic circles uses medical intelligence as a synonym for syndromic and disease surveillance, but the field encompasses much more than those epidemiological topics alone. Even the Centers for Disease Control and Prevention's (CDC) *Pandemic Influenza Operations Plan* released in December 2006 refers to medical intelligence as disease and syndromic surveillance data.[1] Despite prior practice, medical intelligence goes well beyond syndromic and disease surveillance. Joint Publication 1-02 defines medical intelligence (MEDINT) as:

> That category of intelligence resulting from collection, evaluation, analysis, and interpretation of foreign medical, bio-scientific, and environmental information that is of interest to strategic planning and to military medical planning and operations for the conservation of the

[1]. Centers for Disease Control and Prevention, Pandemic Influenza Operations Plan (Atlanta, GA: CDC, 2006), 117.

> fighting strength of friendly forces and the formation of assessments of foreign medical capabilities in both military and civilian sectors.[2]

While military medical intelligence has been around for a number of years, domestic medical intelligence, beyond just syndromic and disease surveillance data, is new. The United States does not currently have a domestic medical intelligence center that focuses on matters within the United States. Currently, state and local fusion centers throughout the nation are attempting to fill the void by including limited medical intelligence functions in their day-to-day operations; however, most limit their data to syndromic and disease surveillance. In addition, the level of inclusion in fusion center operations varies greatly center to center. These vast differences, in conjunction with the lack of a common data set, imply that no effective nationwide common operating picture is available. While the Centers for Disease Control and Prevention is able to obtain AFMIC data for non-military and non-Department of Defense personnel deploying overseas, data are not available for medical personnel deploying throughout the United States. During Hurricane Katrina in 2005, AFMIC did collect small amounts of data on the specific region affected along the Gulf Coast of the United States; however, dissemination of that data was not widespread enough to benefit all of the medical personnel within that theater of operations. Federal medical teams such as the ones coordinated by the National Disaster Medical System have rarely had access to medical intelligence prior to or during an active deployment.

The inability to have access to raw or analyzed data prior to an incident leads to a number of significant undesirable effects. It is a waste of valuable time to have to collect and analyze data once medical teams already have been deployed. Rapid analysis of a non-standardized data set presents a more difficult situation for assets in the field. Teams are called upon to develop their data collection set at the time of the incident, in addition to conducting an analysis in a short amount of time. In addition, data may change incident to incident, making the ability to compare operations from one deployment to the next more difficult. From a public health perspective, the threats and hazards being faced

2. Joint Publication 1-02 Department of Defense Dictionary of Military and Associated Terms (Washington, DC: Department of Defense, 2006), 336.

by both victims and responders typically are not discovered until days, weeks, or even months after the initial deployment. This may put responders in the position of being exposed to potentially life-threatening hazards without adequate medical or pharmaceutical prophylaxis. Even during pre-staged events, data collection has been done in the days or weeks prior to the event based on an ad-hoc data collection tool, as opposed to having a standardized data set for the entire United States. During an active disaster, the ability to collect data is diminished significantly and analysis capabilities also are hindered. For instance, during Hurricane Frances, when federal teams arrived in Florida, there was no available pre-assessment of local hospitals or an assessment of the water supply. The local staff was assuming that the water was potable. One of the federal response teams that happened to have an epidemiologist on board conducted an assessment of the situation and determined that the water was not safe for consumption. During large scale responses in which assets arrive from other jurisdictions, time that could be utilized treating patients must be dedicated to collecting information from local hospitals, including current bed capacity and epidemiologic information. Much of this information can be collected in advance and provided to personnel prior to their deployment. The Department of Defense has the ability to conduct similar assessments for personnel deploying overseas. This allows the leadership to determine what hazards or threats will be faced by its personnel. It also allows it to provide any pertinent vaccines and/or prophylaxis prior to deployment. This thesis posits that a similar capability would be appreciated by national medical responders.

The assumption that medical intelligence implies the creation of a federal repository of private medical records raises significant privacy concerns. However, this is not the information gathering that is being proposed. Gathering medical intelligence does not require or desire the use of individual private medical records. Unfortunately, this misunderstanding has led many to be unwilling to consider the significant benefits of a domestic medical intelligence center.

Aside from federal assets, with the expansion of the Emergency Management Assistance Compact, we see more states sharing assets directly with one another. State and local governments, with the exception of National Guard and State Guard assets, are

unable to access any information collected and distributed by AFMIC. Even if state and local governments were able to request and collect data by passing a request through the channels described in the National Response Plan, the data is focused on nations outside of the United States and would provide little to no benefit to the jurisdiction placing the request. Some regions within a state or states themselves have begun to collect an initial set of data; however, the maintenance of the data becomes an issue, as does the standardization across state lines. Natural, man-made, and technological disasters do not recognize political borders, and rapidly accessible, current, and standardized data are the key to a successful and safe operation.

Within the civilian sector, no single agency has been tasked to collect and maintain this data. Agencies throughout the government collect various components of the ideal data set, including the United States Department of Health and Human Services and the Department of Homeland Security, as do many non-governmental agencies such as the American Hospital Association and other professional organizations. The data from all of these agencies resides within their agencies alone and not in a central location.

B. RESEARCH QUESTION

Does the United States need a domestic medical intelligence center for CONUS operations? If so, what would be the ideal organizational structure? What would be the key responsibilities of this organization? What data would be collected?

C. LITERATURE REVIEW

Literature in the field of medical intelligence is sparse at best. A review of current and past literature reveals a significant amount of literature related to general intelligence and public health, but little within the field of medical intelligence. The limited number of sources on this specific topic that are available are based primarily on military documents and are specific to military operations. A majority of the documentation is found within the Department of Defense, specifically the United States Navy and its Plans, Operations and Medical Intelligence (POMI) program. Documents

include manuals, training materials, and assorted other references. Some of the documents are restricted to limited distribution while some are classified.

The available literature can be grouped into three categories: public health, general intelligence, and medical intelligence. There are thousands of public health textbooks, journals, and published research projects in print and in cyberspace. Textbooks cover a wide variety of subjects, including introductions to public health in *Introduction to Public Health* by M. Schneider and *Principles of Public Health Practice* by F. Scutchfield and W. Keck, and specific fields such as forensic epidemiology in *Forensic Epidemiology* by S. Loue. There are hundreds of peer-reviewed journals, including the Journal of Public Health Policy and the Journal of Epidemiology and Community Health. There are hundreds of thousands of research projects in public health from all subfields, including epidemiology, community health, HIV/AIDS prevention, and a number of other subject areas. Sources include undergraduate and graduate academic research, in addition to a wide variety of public and private organizations. An exhaustive search of public health textbooks, journals, and research projects has yielded no relevant results.

While not to the extent as that of public health, the field of intelligence has a number of textbooks and journals currently in circulation. A majority of the documentation is generated by the Department of Defense, including field manuals, regulations, instructions, and other military-based documents. The Central Intelligence Agency and the Interagency Operations Security Support Staff also produce a number of documents related to the history of the intelligence services, the world of covert operations, terrorist threats and information, and operations security of sensitive material. A majority of the documents either are classified or restricted to limited distribution. In addition to governmental documents, there is a variety of academic and peer-reviewed literature available. Textbooks, including *Strategic Intelligence* by L. Johnson and J. Wirtz and *Silent Warfare* by A. Shulsky and G. Schmitt, provide an in-depth overview of the intelligence community; however they do not discuss the specific field of medical intelligence. There are a number of journals currently in circulation, including Intelligence and National Security and Studies in Intelligence.

The development of federal and in some cases state intelligence agencies or fusion centers is well documented. Several resources discuss the development, reformation, and operations of a number of intelligence partners, such as the Central Intelligence Agency, Federal Bureau of Investigation, Defense Intelligence Agency, and the intelligence branches of the United States Army, United States Air Force, United States Navy, United States Coast Guard, and the United States Marine Corps. In addition, fusion centers, such as the Los Angeles Terrorism Early Warning Group, Illinois Statewide Terrorism Intelligence Center, and the Georgia Information Sharing and Analysis Center, are documented frequently; however, detailed information is not readily available.

The first reference to domestic medical intelligence was found in 2005. In January 2005, Jeffrey Lowell, Senior Advisor for Medical Affairs to the Secretary of Homeland Security (Tom Ridge) published a report entitled *Medical Readiness Responsibilities and Capabilities: A Strategy for Realigning and Strengthening the Federal Medical Response*, which identified the need for a federal level medical intelligence organization. Among other recommendations, Dr. Lowell recommended the appointment of an Assistant Secretary for Medical Readiness and the creation of a Department of Homeland Security Office of Medical Readiness.[3]

The report did not address critical issues, such as what data would be collected and how the data would be initially collected and kept up to date. In addition, since much of this data are currently collected by the states, we could continue with the current methodology of having the states collect the data and feed them into the larger collective. This method currently is in use by many different federal agencies for a multitude of non-medical initiatives. Since a vast majority of the data collected would be at the unclassified level, subsequent report generation and information dissemination is not an issue. While some data most likely would have to be classified, all attempts should be made to limit the number of classified reports, while maximizing the utilization of open source intelligence.

[3]. Medical Readiness Responsibilities and Capabilities: A Strategy for Realigning and Strengthening the Federal Medical Response (Washington, DC: Department of Homeland Security, 2005), 5.

Within academia, a review of a number of undergraduate and graduate programs within the field of intelligence yields no programs that dedicate a course to medical intelligence. The Armed Forces Medical Intelligence Center provides training and education to its staff and partners through a self-learning document entitled, "Medical Intelligence Tutorial," and utilizes existing general intelligence programs, including the National Defense Intelligence College, for hands-on training and education. In addition, a review of a large number of public health programs reveals that none of them offer a course on intelligence operations related to public health. In addition to a void in existing programs, there does not appear to be any current planning for a course of this nature.

There is little academic, peer-reviewed literature on the specific field of domestic medical intelligence and, indeed, literature related specifically to medical intelligence is virtually non-existent. Existing references discuss only one or two small components of a medical intelligence system but do not tie the various pieces together. The existing military documentation is not directly applicable to domestic and domestic medical intelligence operations.

A top government official has identified the need for such a focus, yet no formal resolution has been presented. In order to streamline our nation's health care emergency response capabilities effectively, significant changes must occur.

D. ARGUMENT

In January 2000, the Central Intelligence Agency issued a National Infectious Disease Threat Report (NIE 99-17D). The report stated that:

> New and reemerging infectious diseases will pose a rising global health threat and will complicate security, both nationally and globally, over the next twenty years. These diseases will endanger United States citizens at home [the NIE does not define what it means by 'at home'] and abroad, threaten United States armed forces deployed overseas, and exacerbate social and political instability in key countries and regions in which the United States has significant interests.[4]

[4]. Central Intelligence Agency, National Infectious Disease Threat Report, NIE 99-17D (Washington, DC: Central Intelligence Agency, 2000), 5.

This threat is growing and will continue to grow in the decades to come. The threat was identified multiple times throughout the 1990s[5,6] and continued into the new millennium after the anthrax attacks of 2001, the smallpox threat of the early twenty-first century, the Severe Acute Respiratory Syndrome (SARS) epidemic in the Far East and Canada, and the current influenza pandemic concerns. Speaking at the 2005 World Economic Forum, United States Senate Majority Leader William Frist stated that "I believe we will see a major biological attack sometime within the next ten years."[7] It is unknown what, if any, intelligence reports Senator Frist was referring to as the basis for his comment. While the threat itself is largely indisputable, the question as to whether current terrorist organizations possess the ability to cause widespread morbidity and mortality varies group by group.

Due to the nature of man-made and naturally occurring biological threats, we will never be able to guarantee a complete absence of such a threat. In January 2003, former Secretary Tom Ridge, the first Secretary of Homeland Security, stated that the United States "cannot completely eliminate the possibility of a terrorist attack."[8] We need to ensure that we have prepared and mitigated the threat to the best of our abilities and equipped and trained our nation to respond in the event that the inevitable happens. One of the key gaps in our current ability to accomplish this effectively is the lack of a domestic medical intelligence center that focuses specifically on domestic medical intelligence. As we have seen in the past, fusion centers and other homeland security programs and projects are initiated in response to a potential threat. We also have seen the need to shift from a post-event or post-threat response to a pre-event and pre-threat response. The development of a domestic medical intelligence center, not unlike fusion centers, needs to be accomplished prior to their need, not after. The time and funding

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5. Annette Flanagin and Joshua Lederberg, "The Threat of Biological Weapons – Prophylaxis and Mitigation." *Journal of the American Medical Association* 276 (1996): 419–420.

6. Joan Stephenson, "Confronting a Biological Armageddon: Experts Tackle Prospect of Bioterrorism." *Journal of the American Medical Association* 276 (1996): 349-352.

7. World Economic Forum, Biological Threats to Societies (Davos: World Economic Forum, 2005) http://www.weforum.org/en/knowledge/KN_SESS_SUMM_13593?url=/en/knowledge/KN_SESS_SUMM_13593 (Accessed December 2006).

8. Deborah Charles, "Ridge Tells United States Enemies 'We Are Coming After You,'" Rense, n.d. http://www.rense.com/general34/coming.htm (Accessed December 2006)

required to develop both fusion centers and a domestic medical intelligence center in a true joint matter is extensive and should not be done without appropriate strategic and operational planning.

In addition to the threat from man-made or terrorist-based biological agents, the potentially even larger threat stems from naturally occurring pathogens that either are reemerging or becoming resistant to current pharmacological interventions. The dangers of drug resistant tuberculosis and Staphylococcus aureus, malaria, and even human immunodeficiency virus (HIV)-related complications are growing annually. The increase in resistant strains poses a threat to public health during day-to-day and large scale incident responses. These threats have existed for a number of years and will continue to grow in the future. While not currently on the media forefront in comparison to bioterrorism and influenza pandemic, the casualties resulting from these pathogens could, over the course of a few years, be equal to or greater than that of a bioterrorism attack. Dr Margaret Chan, Director-General of the World Health Organization, has identified emerging biological threats, both man-made and natural, and their subsequent global economic and social consequences to be of global significance.[9] While the World Health Organization does collect syndromic and disease surveillance data from participating nations, it does not expand its medical intelligence functions beyond the identification of emerging threats.

Currently, there is no method for responders from other jurisdictions to collect and analyze medical intelligence and health care capability and capacity data without doing so after arrival at the scene of an incident. Typically, since mutual aid may arrive 12 or more hours post-incident, assets may arrive with patients already in line awaiting treatment. Assigning personnel to this task takes away from potential clinical treatment of patients.

Given the growing threat, the need for a domestic medical intelligence center now is more critical than ever. We have heard a wide variety of officials advise us that the

[9]. Margaret Chan, "Keynote Address at 120th WHO Executive Board Session" (Speech, Geneva, January 22, 2006), http://www.who.int/dg/speeches/2007/eb120_opening/en/index.html (Accessed January 2007).

question essentially is not whether we are going to have a large scale biological event; rather, the question is when it will occur.[10,11,12] In order for us to respond to a large scale biological event, it is critical that we know what assets we have, how they will be coordinated, and how we will sustain a prolonged operation.[13] Various sectors that have traditionally been deemed the "first responders" throughout our nation—the fire service, law enforcement, and emergency medical services—slowly have realized the importance of the other health care and public health partners. In addition, the private sector has realized the potential economic impact if the public health system is unable to manage a response to a biological event. It has realized that the safety of its workforce and its ability to maintain adequate staffing are related directly to a strong public health response. The lack of a well coordinated health care and public health response will have widespread effects on almost every other critical sector.

The general intelligence community has taken decades to evolve into the current system, which is a loosely federated group of independent agencies that has the capability and common culture to produce national intelligence products for federal, state, and local consumption. In order for medical intelligence centers to become active partners in the intelligence community, a number of well calculated steps will have to take place.

In order for such a center to be effective, it must address a wide spectrum of medical intelligence issues, not only syndromic and disease surveillance. An additional success factor is the ability to work closely with partners at the local, state, and federal levels. The federal government is not in a position to have intimate knowledge of what is occurring at the local and state levels. Similarly, unlike the federal government, the state

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10. Betsy Querna, "Avian Flu: 'We're screwed if it hits soon,'" *US News and World Report*, June 16, 2005. http://www.usnews.com/usnews/health/articles/050616/16avian.htm?track=rss (Accessed December 2006).

11. Lara Jordan, "Another Attack Isn't a Matter of If, but When," *The San Diego Union-Tribune*, September 9, 2006. http://www.signonsandiego.com/news/nation/sept11/20060909-0915-sept11-anotherattack.html (Accessed December 2006).

12. PY Lam, Emerging Disease Crisis Management: Regulatory Challenges (Geneva: WHO, n.d). http://www.who.int/medicines/areas/quality_safety/regulation_legislation/icdra/crisisman.pdf (Accessed December 2006).

13. R. Roos, "CIDRAP News WHO Issues Rapid Response Plan for Flu Pandemic," CIDRAP, January 27, 2006. http://www.cidrap.umn.edu/cidrap/content/influenza/panflu/news/jan2706contain.html (Accessed January 2007).

and local governments may not have the resources to respond independently and effectively to an incident. This makes the requirement for effective coordination that much more critical. While vertical cooperation is important, so is horizontal cooperation at the local, state, and federal levels. Local and state agencies must open lines of communication with non-traditional partners. Amongst federal agencies, the center must become an integral partner in the existing intelligence community. Comprehensive situational awareness by all partners, at all levels, will allow for the rapid identification of potential hazards before they occur or shortly after they occur, thereby helping to decrease the overall morbidity and mortality of the event.

Data are being collected by local and state public health departments on a daily basis. These data however are being collected and assessed in stovepipes. Ideally, data should be synchronized and analyzed on state, regional, and federal levels. Access to data outside the local health department should not include any patient-specific or patient identification data. This would address patient privacy concerns that may be raised. Patient privacy issues must be in the forefront throughout all phases of development, implementation, and operation of a domestic medical intelligence center. Historically, the general public has had negative views of the government collecting what it felt was confidential medical data. Unbeknownst to many, the disease and syndromic surveillance systems in place throughout the nation collect general data on a daily basis and forward it regularly to epidemiologists at state health departments. These data are blinded, but allow the health departments to identify potential outbreaks and disease trends before they become widespread. The health departments that collect the data do not know who the patients are. Many areas, such as the National Capital Region, have the ability to view aggregate data from a larger area; however, detailed data are available only within each jurisdiction. While the data do not contain identifiers, the system does allow agencies, in cooperation with the reporting agencies, to trace the data back to the individual patient for their own safety. In the event that an outbreak is detected, it would be vital that all individuals who presented with those potential symptoms were treated as soon as possible.

E. SIGNIFICANCE OF RESEARCH

Due to the significant void in available literature on the topic of medical intelligence, this research may serve as a central collection point for the various components of a domestic medical intelligence system. Thus, it will contribute data and analysis to a field of research that still is largely in its infancy. In addition, it will justify the need for the establishment of a domestic medical intelligence center along with the potential initial organizational structure. This will, in turn, assist in increasing the overall level of public health emergency preparedness in the nation against man-made and naturally occurring biological hazards.

Government, and particularly health officials and public health emergency preparedness directors at all levels of government, should find this research beneficial to both their day-to-day health care emergency preparedness planning efforts and their planning efforts for large-scale responses. Government officials tasked with developing the federal government's preparedness and planning initiatives should find this research advantageous in establishing the initial concept of operations.

F. METHODOLOGY

The research methodology utilized includes a case study of related systems in the Department of Defense and at various intelligence fusion centers in the United States, in addition to a qualitative analysis of each of those systems. In addition to interviewing senior staff from the Department of Homeland Security's Office of Health Affairs, this study will present a model for a domestic medical intelligence center. The research will also propose a set of data points to be collected, based upon currently collected medical intelligence data as reported by the Armed Forces Medical Intelligence Center, and a needs assessment conducted by the District of Columbia Department of Health in relation to its participation in the Metropolitan Washington Fusion Center.

The organizational model presented will be based upon an analysis of existing medical intelligence operations at the Armed Forces Medical Intelligence Center, the

Department of Homeland Security, the Metropolitan Washington Fusion Center, and the Los Angeles Terrorism Early Warning Group.

The proposed model will be presented in a format that will allow for additional and more detailed planning. Financial aspects of establishing such a center will be mentioned; however, they will not be examined in detail.

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II. HISTORY OF MEDICAL INTELLIGENCE

A. MILITARY HISTORY

The history of medical intelligence in the United States military can be traced back to World War II; however, the need for and use of medical intelligence actually can be identified as far back as the Peloponnesian War. The United States Army was the first home of medical intelligence within the Office of the Surgeon General's Preventive Medicine Division. In September 1940, responsibility for medical intelligence for the United States Army was transitioned over to the Army Medical Department. In 1944, the medical intelligence function was recognized formally as a branch within the Preventive Medicine Division.[14] This allowed the Medical Intelligence Branch to distribute information both for planning purposes and for units that may be deployed in various theaters of operation. It also was during World War II that the United States Army modified its internal definition of medical intelligence from being solely directed at its own soldiers to the collection of information regarding foreign medical capabilities.

In the late 1940s, the Central Intelligence Agency began to take an interest in medical intelligence. Its interest was related primary to science and technology issues in foreign nations; however, it began to discuss the possibility of the Central Intelligence Agency serving as the key agency to coordinate all medical intelligence programs. Before it had the opportunity to do so, the Secretary of Defense in 1948 established the "Ad Hoc Committee on Medical and Hospital Services" within the Department of Defense. Commonly known as the "Hawley Board," for its chairman retired Major General Paul Hawley,[15] it comprised a number of subcommittees, including a subcommittee on medical intelligence. This subcommittee filed a report within six months recommending the development of the "Armed Forces Medical Intelligence

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[14]. United States Army, "Developments in Military Medicine During the Administration of Surgeon General Norman T. Kirk," http://history.amedd.army.mil/booksdocs/wwii/DvlpmntsinMilMed.htm (Accessed July 10, 2007).

[15]. Jonathan Clemente, "The Fate of an Orphan: The Hawley Board and the Debates over the Postwar Organization of Medical Intelligence," *Intelligence and National Security* 20, no. 2 (June 2005): 267.

Organization." This agency would coordinate efforts among the United States Army, United States Navy, and the United States Air Force. While housed within the Department of Defense, this agency also would support the needs of other federal agencies, including the Central Intelligence Agency. The recommendation by the subcommittee was accepted by the Hawley Board later that year.

However, this was not the end of a long and arduous battle surrounding military medical intelligence. The recommendation of the Hawley Board was not well received by the intelligence community, and the United States Government embarked on a multi-year journey to find the appropriate home for medical intelligence. Subsequently, in 1954, the Army Surgeon General accepted the recommendations of the "Ad-Hoc Committee on Medical Intelligence" and established the Medical Information and Intelligence Division within the Office of the Surgeon General.

Through a number of transformations, including the United States Army Medical Intelligence and Information Agency, the latest iteration of a medical intelligence function within the military can be seen within the Armed Forces Medical Intelligence Center (AFMIC). AFMIC was created in 1982 as a tri-service organization focused on foreign medical intelligence operations. In 1992, through the Department of Defense Authorization Act, AFMIC was transferred to the Defense Intelligence Agency and became a Defense Intelligence Agency Field Production Activity. According to Department of Defense Directive 6420.1, dated 09 October 2004, AFMIC has four main missions:[16]

- Acting as the focal point in the Department of Defense for compiling all-source intelligence and producing finished intelligence on foreign military and civilian medical capabilities, to include the health status of foreign military forces, infectious disease and environmental health risks, and scientific and technical developments in biotechnology and biomedical subjects of military importance.

[16]. Department of Defense Directive 6420.1 (Washington, DC: Department of Defense, October 2004), Section 3.2.

- Producing and distributing medical intelligence products and assessments in support of the Department of Defense components.
- Managing the medical aspects of the Department of Defense Materiel Program.
- Accomplishing such other production assignments as are tasked by the Director, Defense Intelligence Agency.

Historically, AFMIC has been focused solely on operations outside of the continental United States; however, during the recent Department of Defense response to Hurricane Katrina in 2005, AFMIC did provide an overview of health issues in support of Department of Defense personnel assigned to Joint Task Force Katrina.

As previously mentioned, the Department of Defense, through the Armed Forces Medical Intelligence Center, collects, analyzes, and disseminates medical intelligence to Department of Defense assets and partners around the globe. Despite its expertise and ability to conduct such intelligence operations, it currently is extremely limited in its ability to collect data within the United States. While the role of the United States Northern Command (USNORTHCOM) is evolving, it is unknown whether its mission will begin to involve medical intelligence operations within the United States. This severely limits the ability of our responders to respond effectively and manage any large-scale incident.

B. CIVILIAN HISTORY

Traditionally, public health personnel have limited the concept of medical intelligence to syndromic and disease surveillance systems. There is little to no inclusion of the myriad of other public health emergency preparedness systems that are in use on a daily basis. For instance, while there is some literature surrounding general disease or syndromic surveillance systems and systems maintained by the federal government, there is little literature about school nurse-based reporting systems. In addition, discussions surrounding public health based radiation safety programs and public health management of large-scale incidents is extremely limited. This shortsightedness has contributed to a

slower forward progression in this vital field. While the design and organization of public health departments varies drastically state by state and city by city, data that could be collected by a medical intelligence center would provide important insights, regardless of the system's design.

States throughout the nation, in addition to the United States Department of Health and Human Services and the Centers for Disease Control and Prevention, collect, analyze, and report on disease and medical surveillance data on a daily basis; however, their investigations are limited primarily to disease and syndromic surveillance data.

Currently, one of the major "threats" facing the nation, and the world, is that of an influenza pandemic. While this may be a viable threat at this time, it appears that every few years we are preparing for an event involving some type of biological agent, either man-made or those that occur naturally. Despite this ever present threat, we cannot accurately list the number of available hospitals beds in the nation at any given time. While the United States Department of Health and Human Services currently is in the process of implementing a system to analyze bed capacity throughout the nation, it still is years away from implementation. In addition, beds are only the tip of the iceberg in relation to medical surge capacity planning efforts. Without the appropriate staff, equipment, and supplies, the beds themselves are useless. There are a number of "independent analysis cells" that collect and analyze incoming data in a wide variety of potential subject areas. Unfortunately, the data are not reported to other agencies either in detail or aggregate.

In addition, there is no single central analytic cell to help put all of the pieces of the puzzle together. The identification of one unusual event within the larger data set may not be an issue; however, when coupled with one or two unusual incidents within the same timeframe or geographic area, it may be a cause for concern. While a limited number of intelligence fusion centers throughout the nation have begun utilizing medical intelligence analysts within their organizations, many are isolated from a vast majority of the intelligence data being reviewed or have limited their participation solely to syndromic and disease surveillance.

Unfortunately, when dealing with biologic threats, retrospective analysis is not the most effective method of analysis. Delays in the identification of a biological agent in the United States or en route to the United States can have grave consequences. In order to limit the spread of disease and the subsequent morbidity and mortality, we must decrease the time needed to identify a harmful pathogen and monitor potential threats throughout the globe. The development of a domestic medical intelligence center can assist with monitoring this type of information.

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III. EXISTING MEDICAL INTELLIGENCE OPERATIONS

A. ARMED FORCES MEDICAL INTELLIGENCE CENTER

1. Organizational Design

The Armed Forces Medical Intelligence Center (AFMIC) currently is organized within the Defense Intelligence Agency and located at Fort Detrick in Maryland. AFMIC has an extensive history in medical intelligence operations overseas; however, it performs limited operations within the United States. AFMIC's mission statement states that it shall "produce finished, all-source, medical intelligence in support of the Department of Defense and its components, national policy officials, and other federal agencies. Assessments, forecasts, and databases are prepared on foreign military and civilian medical systems, foreign infections disease risks, foreign environmental health risks, and foreign life sciences and biotechnology."[17]

AFMIC, which performs a wide variety of functions in relation to medical intelligence and force health protection matters, is divided into five primary divisions: programs and operations, infectious disease, medical capabilities, environmental health, and medical science and technology, as seen in Figure 1. While many of AFMIC's functions should be replicated in a domestic medical intelligence center, many would not. Some of AFMIC's key functions are described in table 1. They include extensive collection and analysis of science and technology issues in addition to the health status of foreign leaders, the latter in conjunction with the Central Intelligence Agency's Medical and Psychological Analysis Center. These functions would not necessarily have to be utilized within the United States, as the first is tracked by the Department of Health and Human Services in conjunction with the Department of Homeland Security during critical infrastructure assessments and analysis.

17. Armed Forces Medical Intelligence Center Brochure (Washington, DC: Department of Defense, October 2003), 2.

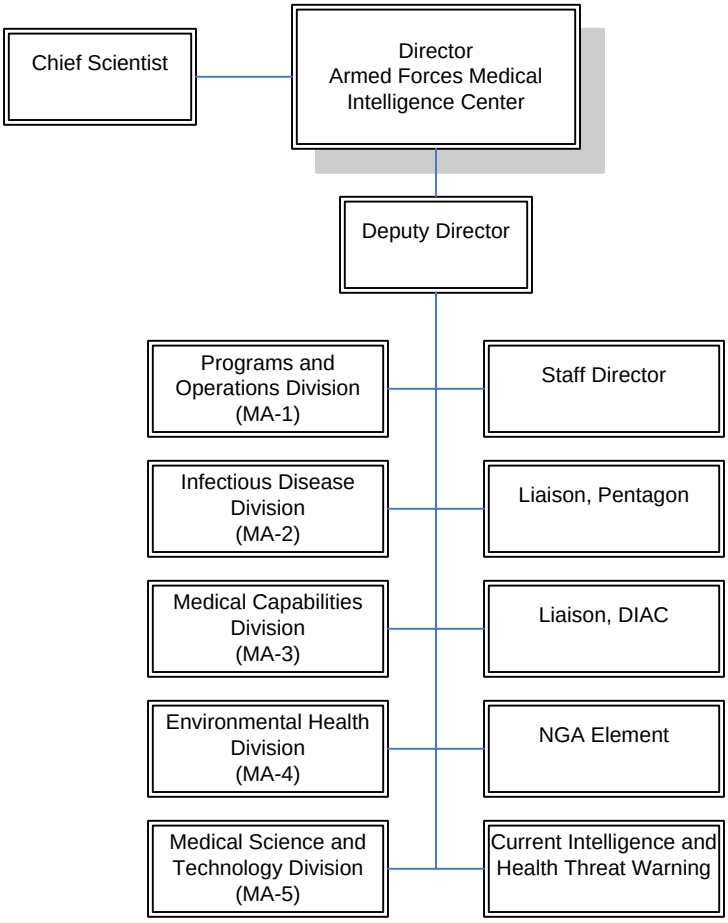

Figure 1. AFMIC Organizational Chart (16 Oct 06). [About Armed Forces Medical Intelligence Center http://mic.afmic.detrick.army.mil/].

2. Staffing

Staffing within AFMIC is a combination of military and civilian employees with contractor support. As a tri-service agency, AFMIC has military personnel from the United States Army, United States Air Force, and the United States Navy. AFMIC utilizes a variety of clinical and non-clinical personnel to collect, analyze, and report on data. In addition to personnel who are assigned permanently to AFMIC, some personnel are on detail assignments from other agencies. In addition to the traditional sciences one

would expect in such a center, AFMIC is extensively involved in simulation and modeling activities and is always attempting to stay on the leading edge of information delivery methods and systems.

Medical Capabilities	Assessment of foreign military and civilian medical capabilities, including treatment facilities, medical personnel, emergency and disaster response, logistics, and medical/pharmaceutical industries
	Maintenance and updating of an integrated database on all medical treatment, training, pharmaceutical, and research and production facilities
Environmental Health	Identification and assessment of environmental risks that can degrade force health or effectiveness, including chemical and microbial contamination of the environment, toxic industrial, chemical and radiation accidents, and environmental terrorism/warfare
	Assessment of the impact of foreign environmental health issues and trends on environmental security and national policy
Infectious Disease	Identification, assessment, and reporting on infectious disease risks that can degrade mission effectiveness of deployed forces and/or cause long-term health implications
	Alert operational and policy customers to foreign disease outbreaks that have implications for national security and policy formulation, including homeland defense and deliberately introduced versus naturally occurring disease outbreaks.
Life Sciences and Biotechnology	Assessment of foreign basic and applied biomedical and biotechnological developments of military medical importance
	Assessment of foreign civilian and military pharmaceutical industry capabilities
	Assessment of foreign scientific and technological medical advances for defense against nuclear, biological and chemical warfare
	Prevention of technological surprise
	Prevention of proliferation of dual-use equipment and knowledge

Table 1. Armed Forces Medical Intelligence Center (AFMIC) Functions.

3. Data Collection and Reporting

AFMIC customers can receive assessments based on their own requirements. While AFMIC excels at providing information related to force protection issues, its ability to provide tactical intelligence is limited. In addition to some standardized reports, AFMIC responds to individual requests for information and can provide responses via telephone, fax, or e-mail in both classified and unclassified formats. In addition, AFMIC regularly distributes a CD-ROM known as MEDIC (Medical, Environmental, Disease, Intelligence, and Countermeasures). AFMIC maintains web sites on the non-classified Internet protocol router network (NIPRNET), secret Internet protocol router network (SIPRNET), and the Joint Worldwide Intelligence Communications System (JWICS), thereby having the capability of providing information via the web at the unclassified, secret, and top secret levels. AFMIC's key medical intelligence products include:[18]

a. **Medical, Environmental, Disease Intelligence, and Countermeasures (MEDIC)** - provides worldwide infectious disease and environmental health risks hyperlinked to the Joint Service-approved countermeasure recommendations, military and civilian health care delivery capabilities, operational information, disease vector ecology information, and reference data.

b. **Health Services Assessment (HSA)** - provides consumers the bottom-line assessment of a country's health services capability.

c. **Infectious Disease Risk Assessment (IDRA)** - pre-deployment force protection planning guidance that assesses the baseline risk from infectious diseases of operational military significance on a country-by-country basis worldwide.

[18]. Department of Defense, "Defense Intelligence Agency – Armed Forces Medical Intelligence Center," https://afmicuweb.afmic.detrick.army.mil/index.php (Accessed July 20, 2007).

d. **Environmental Health Risk Assessment (EHRA)** - assesses environmental health risks of operational military significance on a country-by-country basis worldwide.

e. **Infectious Disease Alert** formerly known as the Disease Occurrence Worldwide (DOWW) - short, timely alerts that assess risk to U.S. forces from foreign disease outbreaks that may impact military operations, and forecast disease risks associated with recent environmental disasters.

f. **Industrial Facility Health Risk Assessment (IFHRA)** - assesses health risks associated with potential exposure to toxic industrial chemicals at specific industrial facilities worldwide.

g. **Industry Sector Profile (ISP)** - assesses potential environmental and human health impacts related to routine emissions and large-scale chemical releases from industrial activities by the industrial sector.

h. **Facility Health Based Prioritization (FHBP)** - provides a country-by-country prioritization of industrial facilities based on potential exposure to toxic industrial chemicals and expected adverse health effects.

i. **Life Sciences and Biotechnology** - assesses foreign basic and applied biomedical and biotechnological developments of military medical importance, foreign civilian and military pharmaceutical industry capabilities, and foreign scientific and technological medical advances for defense against chemical, biological, radiological, and nuclear warfare.

j. **Medical Intelligence Note (MIN)** - provides a brief assessment of important medical developments to meet time-sensitive requirements for support to medical planning and decision-making, as well as materiel research, development, and acquisition.

B. DEPARTMENT OF HOMELAND SECURITY

1. Organizational Design

The Department of Homeland Security was formed in 2002, bringing 22 separate entities together into one cabinet-level agency (see Figure 2).

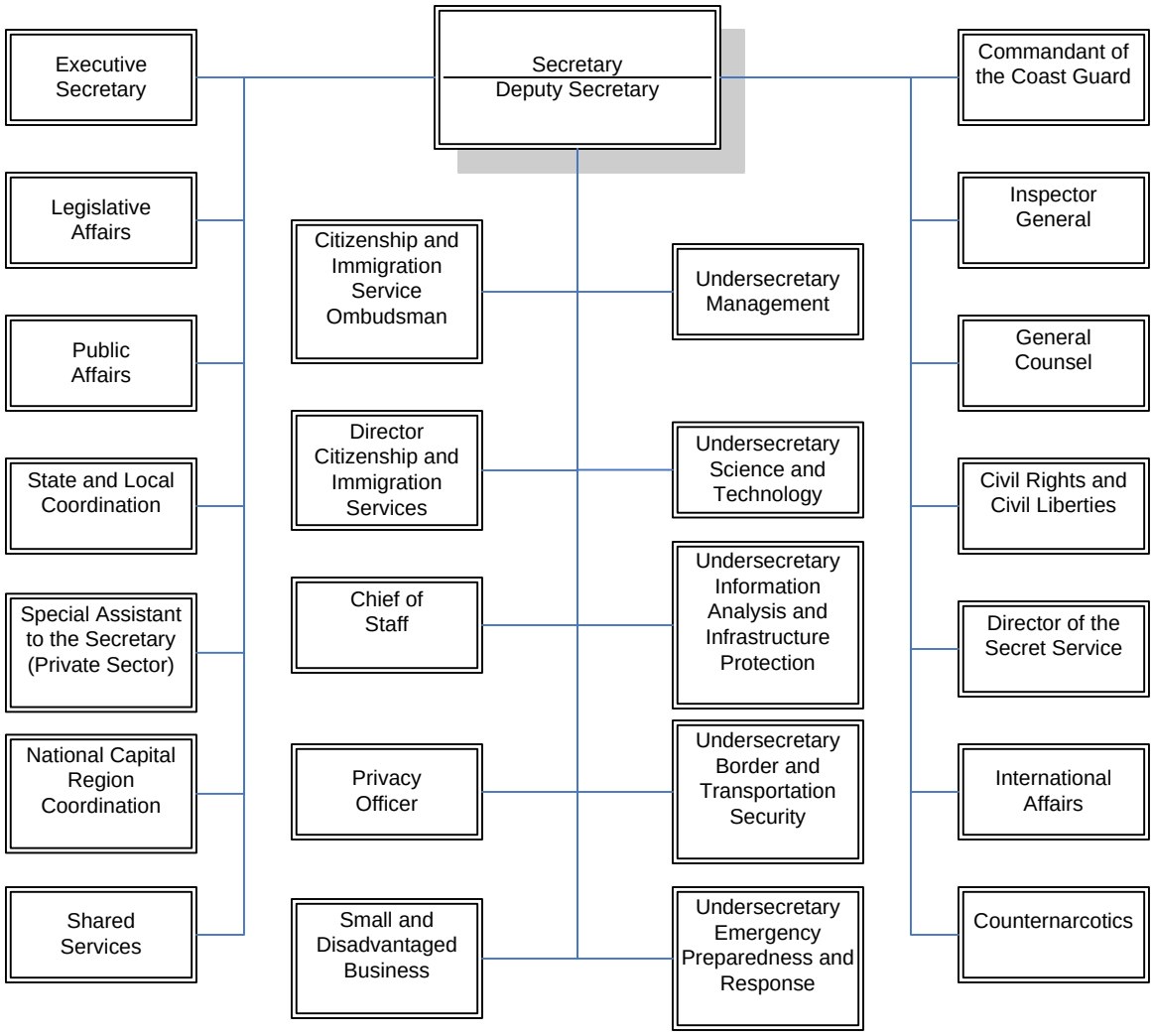

Figure 2. Department of Homeland Security Organizational Chart (Pre-2004). [About Department of Homeland Security http://www.dhs.gov/xlibrary/assets/DHS_Org_Chart-2003.ppt].

As the agency continued to mature, grow, and reorganize (see Figure 3), it soon realized the need to have the capability to provide health and medical advice to the Secretary for the planning, preparedness, and response to incidents of national significance (INS). During the Second Stage Review conducted shortly after the arrival of Secretary Michael Chertoff in 2005, the need for the development of an Office of Health Affairs (see Figure 4) was identified. The Office of Health Affairs is led by the Assistant Secretary of the Office of Health Affairs, who also holds the title of Chief Medical Officer.

Since the United States Department of Health and Human Services is the lead for Emergency Support Function #8, some feel that the development of an Office of Health Affairs within the Department of Homeland Security may cause additional undue conflict.[19]

In order for a domestic medical intelligence center to be effective, it must develop and maintain effective working relationships with a number of other agencies on a federal, regional, state, and local level. One of the key relationships is with the Department of Health and Human Services. Since the Department of Homeland Security has defined its role as non-competitive in nature,[20] many individuals have a hard time understanding the differentiation in roles between these two agencies. While the existing relationship is clear to some, it remains unclear to others, and additional clarification will be necessary.

[19]. Senior state and federal public health emergency preparedness officials, conversations with author, Washington, DC, Spring 2007. All conversations were in confidence and the names of individuals are withheld by mutual agreement.

[20]. Kimothy Smith (Department of Homeland Security), interview by author, Washington, DC, August 6, 2007.

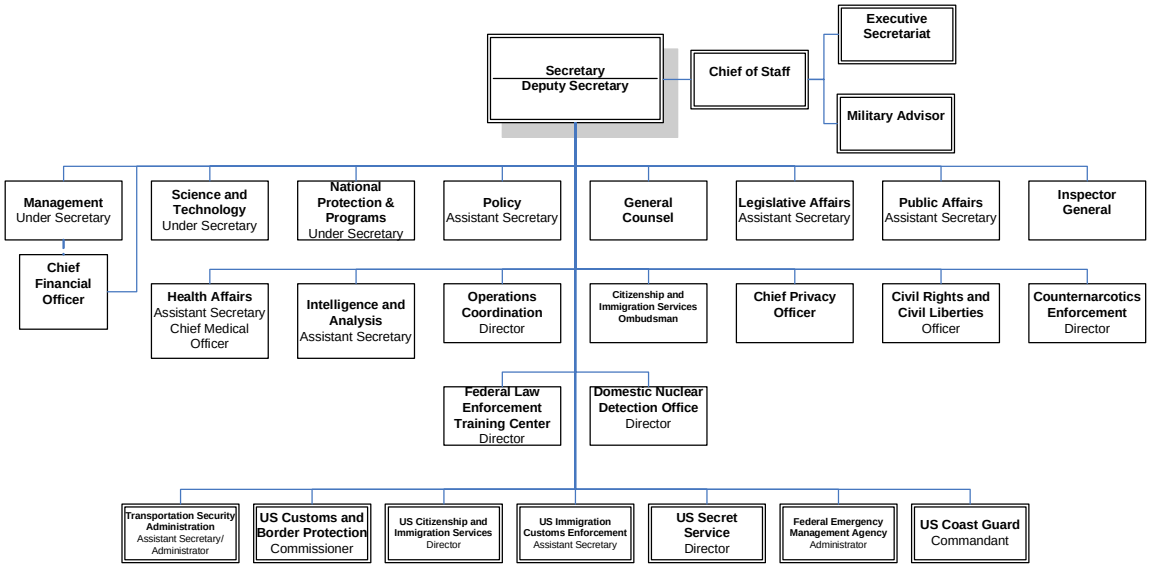

Figure 3. Department of Homeland Security Organizational Chart (01 Apr 07). [About Department of Homeland Security http://www.dhs.gov/xlibrary/assets/DHS_OrgChart.pdf].

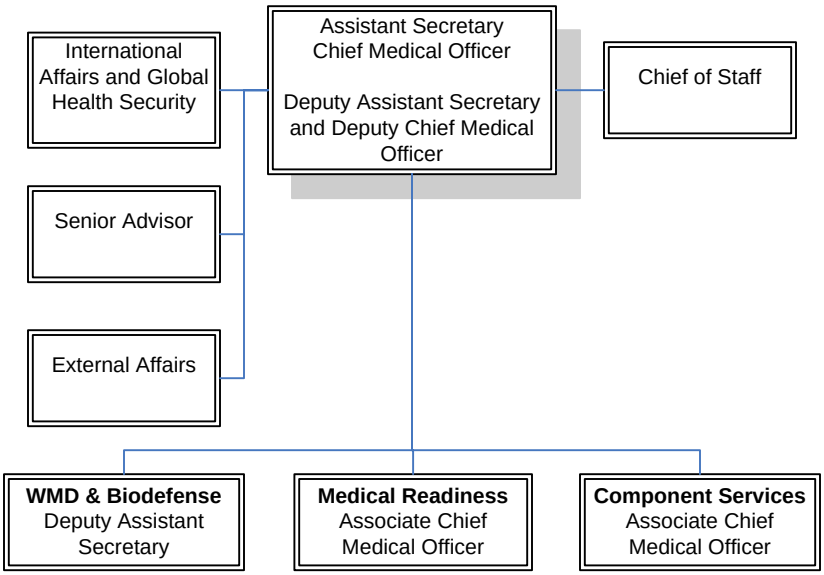

Figure 4. DHS Office of Health Affairs Organizational Chart. [About Department of Homeland Security http://www.dhs.gov/xlibrary/assets/DHS_OrgChart.pdf].

2. Staffing

The Office of Health Affairs is organized into four primary areas: international affairs and global health security, weapons of mass destruction and biodefense, medical readiness, and component services. The latter two functional areas are run by an Associate Chief Medical Officer, while the second is run by a Deputy Assistant Secretary. The Office of Health Affairs has grown from its initial staff of three in the fall of 2005 (originally called the Office of the Chief Medical Officer) to a request for 49 full-time equivalent employees for fiscal year 2008.[21] Currently, the Office of Health Affairs comprises a combination of career federal employees, United States Public Health Service commissioned officers, academic staff, and subject matter experts through Interagency Personnel Agreements, contractor support, detailees from the National Geospatial Intelligence Agency, Department of Defense, and, effective 01 September2007, the Centers for Disease Control and Prevention.[22]

3. Data Collection and Reporting

The Department of Homeland Security currently produces a number of health care and public health documents, including critical infrastructure reports and threat assessments. The Homeland Infrastructure Threat and Risk Analysis Center (HITRAC) sector assessments discuss the current threats to each sector, including health care and public health, and provide a brief analysis of each threat. While these, and similar, documents do provide a type of medical intelligence, they serve as only one component of the overall medical intelligence picture. However, the reports do not include a majority of the data points described in this proposal.

One of the key entities within the Office of Health Affairs responsible for the collection of medical intelligence data is the National Biosurveillance Integration System

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[21]. Department of Homeland Security, "Statement for the Record Jeffrey W. Runge, MD Chief Medical Officer Office of Health Affairs before the U.S. House of Representatives Committee on Appropriations Subcommittee on Homeland Security Bioterrorism Preparedness and Role of DHS Chief Medical Officer," http://www.dhs.gov/xnews/testimony/testimony_1175280009133.shtm [Accessed April 15, 2007].

[22]. Smith interview.

(NBIS). NBIS is a relatively new organization that is evolving constantly. This office is responsible for the integration and analysis of biosurveillance data from a wide variety of sources, including agricultural, public health, and biodefense arenas. However, due to the large number of partner agencies involved in this undertaking, it has not come without its share of challenges. Some of the key challenges include the lack of a large number of subject matter experts, a limited pool of operatives on the ground conducting information collection, and the perception, while not an accurate one, of DHS attempting to participate in missions traditionally held by other governmental agencies. While there are intentionally no intelligence personnel assigned to NBIS, they work closely with the Department of Homeland Security's Intelligence and Analysis Office and utilize them as their link into the rest of the intelligence community.

C. METROPOLITAN WASHINGTON FUSION CENTER (WASHINGTON, DC)

1. Organizational Design

The Metropolitan Washington Fusion Center (MWFC) is a collaborative effort among the Metropolitan Police Department, District of Columbia Fire and EMS Agency, District of Columbia Department of Health, District of Columbia Homeland Security and Emergency Management Agency, District Department of Transportation, Federal Bureau of Investigation, Department of Defense, and other local, regional, and federal partners. The center is designed as a multidisciplinary group with the current project manager being provided by the Metropolitan Police Department. While the project manager is supplied by the Metropolitan Police Department, the actual oversight and governance of the center is conducted by a multi-agency governance board.

2. Staffing

The Metropolitan Washington Fusion Center has been divided into two initial groups. The first group is responsible for the development of the fusion center; the latter includes additional agencies that will be involved in the operations of the fusion center once it is developed and made operational.

Staff at the MWFC will consist of a combination of federal, district, state, local, and military personnel, with additional contractor support as necessary.

3. Data Collection and Reporting

During the initial stages of the fusion center, data collection and reporting is conducted based upon a variety of open source reports, reports from other fusion centers throughout the nation, and federal and military sources. Information is collected and analyzed on a daily basis and disseminated to partners as part of the Daily Summary. As the fusion center continues to evolve, the identified data streams within the District and the National Capital Region will be fed into the fusion center for inclusion in the daily summaries. In the field of medical intelligence, more than twenty data sources will be fed into the fusion center for analysis, sharing, and reporting purposes. The data fields currently identified are discussed in detail in Chapter IV. These data will be provided back to the Department of Health in an analyzed format, along with information being presented to the other fusion center partners for their awareness and inclusion in the daily summaries. In addition to daily reports, the fusion center staff have the ability to develop reports, briefings, and other information products based on emerging threats, acts of terrorism both domestic and internationally, and other tailored reports requested by fusion center partners.

D. LOS ANGELES TERRORISM EARLY WARNING GROUP

1. Organizational Design

The Los Angeles Terrorism Early Warning Group (TEW), designed by Los Angeles Sheriff's Department deputies John Sullivan and Larry Richards, was essentially the predecessor to what is currently known as an intelligence fusion center. The TEW was created in the fall of 1996 and consisted of representatives from the Los Angeles Sheriff's Department, the Federal Bureau of Investigation, the Los Angeles Police Department, the California Office of Emergency Services, the city and county of Los Angeles fire departments, the Department of Health Services, and several representatives

from assorted academic and research institutions. The relationships among members of the TEW, as with most networked relationships, have taken years to develop.

As the TEW evolved, it added additional partners, including the various local, state, and federal law enforcement agencies, the National Guard, the United States Coast Guard, and various emergency management agencies, fire departments, transportation authorities, universities, and airports. The TEW comprises six integrated cells: Forensic Intelligence Support, Epidemiological Intelligence, Analysis/Synthesis, Consequence Management, Investigative Liaison, and the Officer-in-Charge. The organization of the six cells can be seen in Figure 5. For the purposes of this analysis, examination of the integrated cells will be limited to those with a medical intelligence-related function.

The Epidemiological Intelligence Cell conducts medical intelligence operations, including disease surveillance, analysis of food, water, and agricultural issues, isolation and quarantine issues, and medical surge capacity issues. In addition, the Epidemiological Intelligence Cell also examines veterinary epidemiological

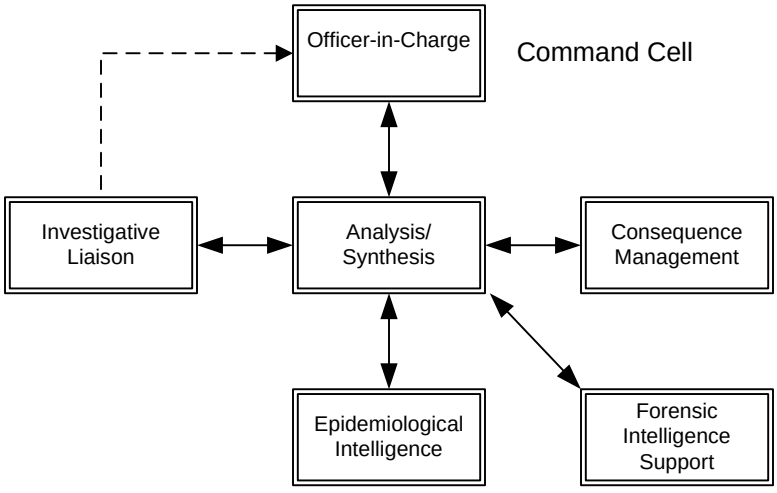

Figure 5. TEW Organizational Chart.[23]

[23]. M. Grossman, "Perception of Fact: Measuring the Effectiveness of the Terrorism Early Warning (TEW) Group" (MA thesis, Naval Postgraduate School, 2005), 22.

Data; however it has identified the need to expand its current capabilities in this area.[24] The TEW has been cited in many sources[25,26,27] as a promising practice in the field of intelligence fusion.

2. Staffing

The management of the Los Angeles Terrorism Early Warning Group follows a unified command structure, in that there is no single organization designated as the lead. The Los Angeles Sheriff's Department serves as the primary logistical body, assisting with the scheduling and execution of the TEW's operational needs including training, communications, and housing. Each of the six cells is staffed by subject matter experts from the fields represented by the TEW's membership. Clinical staff at the TEW consists of both physicians and nurses. In addition, paramedics also are located at the TEW; however, they are located within the Consequence Management cell.

In addition to the staff assigned to the TEW, Terrorism Liaison Officers (TLO) also are trained and utilized throughout the region. There are TLOs for a variety of functions, including health care and public health. Each agency involved designates a TLO and this individual serves as the primary point of contact for all terrorism-related information. The TEW has developed a training program for all TLOs and encourages them to share information that they receive or notice that may be helpful to the TEW.

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[24]. John Sullivan, "Integrated Threat and Net Assessment: The L.A. Terrorism Early Warning (TEW) Group Model" (presented at the RAND National Security Research Division Bioterrorism Symposium, California, February 8–10, 2000).

[25]. Siobhan Gorman, "Efforts to combat nuclear terrorism hindered by porous borders," Government Executive. http://www.govexec.com/story_page.cfm?articleid=31519&ref=rellink (Accessed June 24, 2007).

[26]. Neal Pollard, Terrorism Early Warning Group: A Concept for Emergency Responder Information Sharing and Intelligence Fusion (Washington, DC, Terrorism Research Center, 2003).

[27]. Second Annual Report to The President and The Congress of the Advisory Panel to Assess Domestic Response Capabilities for Terrorism Involving Weapons of Mass Destruction (Washington, DC: n.p., December 14, 2000).

3. Data Collection and Reporting

Data is collected through a wide variety of sources, including the organizations represented on the Los Angeles Terrorism Early Warning Group (see Figure 6). In regard to medical intelligence, data collection appears to be limited to disease surveillance, animal surveillance, food and water surety data, medical surge, and agricultural issues.

In addition to standard reports, which follow an internal approval process prior to dissemination to authorized personnel, the TEW has begun designing playbooks for a variety of different scenarios. The TEW already has completed a playbook for biological events[28] and hopes to continue to develop additional playbooks in the future.

28. John Sullivan, "Integrated Threat and Net Assessment: The L.A. Terrorism Early Warning (TEW) Group Model" (presented at the RAND National Security Research Division Bioterrorism Symposium, California, February 8–10, 2000).

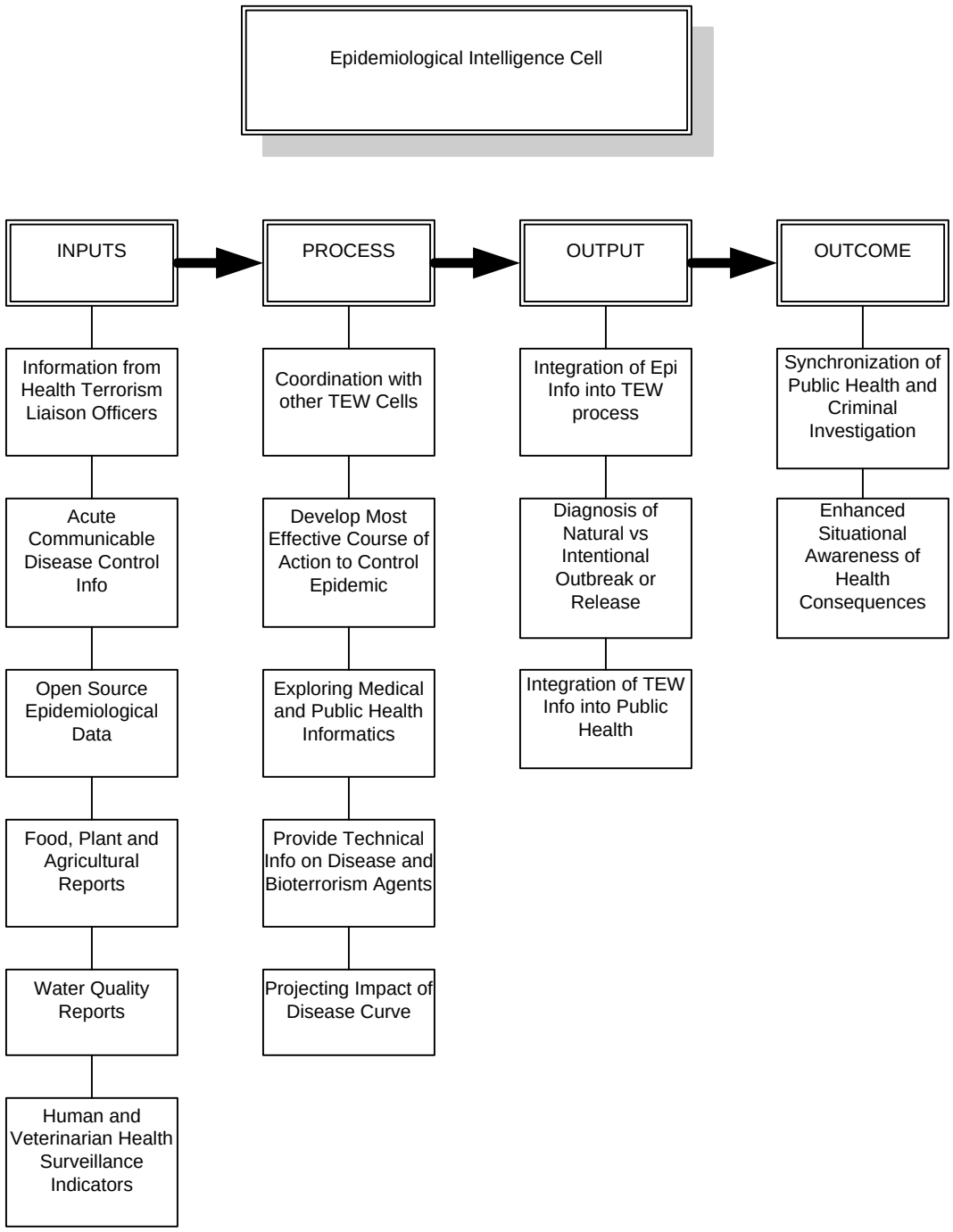
Epidemiological Intelligence Cell
INPUTS
PROCESS
OUTPUT
OUTCOME
Information from Health Terrorism Liaison Officers
Acute Communicable Disease Control Info
Open Source Epidemiological Data
Food, Plant and Agricultural Reports
Water Quality Reports
Human and Veterinarian Health Surveillance Indicators
Coordination with other TEW Cells
Develop Most Effective Course of Action to Control Epidemic
Exploring Medical and Public Health Informatics
Provide Technical Info on Disease and Bioterrorism Agents
Projecting Impact of Disease Curve
Integration of Epi Info into TEW process
Diagnosis of Natural vs Intentional Outbreak or Release
Integration of TEW Info into Public Health
Synchronization of Public Health and Criminal Investigation
Enhanced Situational Awareness of Health Consequences

Figure 6. Los Angeles TEW Epidemiological Intelligence Cell. [About Grossman, *Perception of Fact*, 38].

E. ANALYSIS

As these examples have shown, the breadth and scope of medical intelligence varies greatly organization to organization. Some agencies limit medical intelligence to disease and syndromic surveillance while others include a wide variety of data fields and sources. This is one of the first challenges that needs to be addressed. Agencies throughout the nation involved in domestic medical intelligence must establish the general scope of domestic medical intelligence. From there, the development of a common set of definitions for the various data sets, in addition to establishing the data set itself, is essential.

The sharing of information and report dissemination methods range significantly, from web-based reporting and CD-ROM-based data sources to no reporting at all. The number of partner agencies actively involved in specific medical intelligence duties also ranges widely.

These examples provide a plethora of lessons learned when examining the establishment of a medical intelligence center, both what one should do and what one should avoid. One critical step is determining who will serve as the key partners. In addition, we must assess what already is collected and what is currently available. Just because data is being collected by an agency or entity does not mean that it would necessarily be available to another agency for integration or analysis. Further review and analysis of all four of these operations will be required as the plans for development of a domestic medical intelligence center move forward. Some of the key lessons to be learned are the early identification of the center's mission space and the need to avoid mission creep. In regard to reporting, we must make sure that the reports meet the needs of the end user and provide actionable intelligence. Reports for the sake of reporting are a waste of time and effort on all sides. Essentially, key issues surround not only the personnel and data but the network and system in which they exist.

IV. DEVELOPMENT OF A DOMESTIC MEDICAL INTELLIGENCE CENTER

A, LEGISLATIVE REQUIREMENTS

1. Existing Legislation

A review of existing state and federal legislation reveals legislation containing the words “medical” and “intelligence” only on a federal level. There does not appear to be any legislation specifically addressing medical intelligence on a state or local level. In addition to federal legislation, the federal government had a number of Department of Defense directives, Presidential Executive Orders, and other federal documents that discuss or govern medical intelligence operations on a federal level. None appear to be applicable to state and local governments.

2. Proposed Legislation

A review of legislation currently proposed on a local, state, and federal level yielded negative results.

3. Necessary Legislation

Legislation will be necessary to initiate a domestic medical intelligence center. In addition, legislation surrounding medical intelligence will require a multifaceted capability to collect and analyze a combination of clinical and non-clinical data. This will require adequate planning to prevent significant backlash from the general public. Legislation for the collection of domestic medical intelligence must be limited in scope to prevent the possibility of the intelligence being utilized for ulterior motives within the law enforcement and legal systems. However, at the same time there is a need to ensure that sufficient, blinded data can be collected in order for the intelligence center to be useful. Legislation on state, local, tribal, and territorial levels will need to be developed,

in addition to federal legislation. If legislation is initially generated on a federal level, it may assist state, local, tribal, and territorial governments in drafting theirs subsequently.

B. GOVERNMENTAL ORGANIZATION

1. Where Does It Belong?

A number of issues need to be discussed regarding the development of a domestic medical intelligence center; however, none may be more critical or political than deciding which Department within the Executive Branch is chosen to maintain and sustain this effort.

There are three primary options related to a "home" location for a domestic medical intelligence center. They are the Department of Defense, within the Defense Intelligence Agency/Armed Forces Medical Intelligence Center; the United States Department of Health and Human Services; and the Department of Homeland Security.

If the center were to reside within the Department of Defense, it would be able to be absorbed by the Armed Forces Medical Intelligence Center. While there would need to be supplemental personnel and funding associated with this initiative, a significant amount of the infrastructure and existing subject matter expertise already is in place. However, the use of the Department of Defense for intelligence operations within the United States brings with it a unique set of legal challenges. Executive Order 12333, signed on 4 December 1981, describes the intelligence functions authorized for various federal agencies. Section 1.11 describes the role for the Department of Defense with a strong and consistent focus on foreign or international activity. The only discussion regarding operations within the United Stated occurs in subsection (d) which states, "conduct counterintelligence activities in support of Department of Defense components outside the United States in coordination with the CIA, and within the United States in coordination with the FBI pursuant to procedures agreed upon by the Secretary of Defense and the Attorney General."

While DoD intelligence operations have been extremely limited within the United States, the ever expanding and evolving role of the United States Northern Command

(USNORTHCOM) plays a factor in potential future operational capabilities. However, it appears that any significant expansion in domestic intelligence operations would require a revision to existing executive orders.

The United States Department of Health and Human Services does not have the existing infrastructure to establish and maintain an intelligence function. HHS recently developed an Office of Security and Strategic Information (OSSI) that is responsible for the establishment and maintenance of its information security program needs, such as the appropriate storage and management of classified documents and the development and management of secure communications equipment. Developing a center within the Department of Health and Human Services would be as, if not more, costly than starting a stand-alone center. In addition, the subject matter expertise for intelligence collection, analysis, and dissemination does not exist within the organization at this time.

The third alternative is the United States Department of Homeland Security, which already has an existing intelligence function that is well established both physically and strategically. This, combined with its current position in the emergency preparedness and response community, its state and local government outreach, governmental coordination, and existing infrastructure would make DHS a viable option. More specifically, the center should be located within the Office of Health Affairs. This directorate already has a well established background in coordination with both the medical and intelligence communities. In addition, it has many of the physical resources required to establish and maintain an intelligence operations in collaboration with other Departmental intelligence functions. Also, United States Department of Homeland Security Chief Intelligence Officer Charlie Allen has stated that it is his intention to have a DHS intelligence analyst in each state and local fusion center in the nation. While this is an admirable desire, it would not address the medical intelligence issue unless it includes personnel with health experience and changes the existing mentality among most fusion centers that the role of medical intelligence is not a priority. This connection will be vital in the collection and sharing of data with state and local governments.

Aside from these three primary options, other alternatives include private or public universities or a federally-funded research and development center (FFRDC). The

utilization of private or public universities may be a cause of concern to some state and local governments and could potentially affect participation in the program. The utilization of a federally-funded research and development center also could be controversial.[29] While medical intelligence does not contain patient-specific data, the perception of the general public may be that state, local, tribal, and territorial governments are sharing private information with universities or private corporations.

Of the options presented, the best of those currently available would be the Department of Homeland Security. This option would require the fewest legislative changes and would be least costly to implement. Costs incurred would be limited to personnel and their supporting office infrastructure. This would allow the development of a single center, at the national level, to coordinate all domestic medical intelligence functions.

2. Who are the Key Partners?

One of the fundamental discussions surrounding whether medical intelligence is an intelligence function with a medical focus or a medical function with an intelligence focus concerns staffing. This fundamental decision will guide a majority of the day-to-day operations of a domestic medical intelligence center. I propose that it is an intelligence function with a medical focus but not based on what currently is commonly referred to as intelligence. On a state and local level, intelligence is all too frequently focused on terrorism and criminal activities. This focus leaves the intelligence ball in a law enforcement court as opposed to providing a multi-agency approach. In order for this type of a center to be effective, intelligence must be taken out of the criminal arena and included as part of a larger, more diverse program.

Both within the intelligence community and the health care and public health community, many agencies need to be involved in order for a domestic medical intelligence center to be effective. The first, and probably the most important,

[29]. Kevin Kosar, "The Quasi Government: Hybrid Organizations with Both Government and Private Sector Legal Characteristics," Congressional Research Service Report for Congress (CRS Order Code RL20533), 15.

relationship is with the United States Department of Health and Human Services (DHHS). The Department of Health and Human Services will serve as a key conduit for information sharing, both in and out of a domestic medical intelligence center. In addition to providing a pathway to contact state, local, tribal, and territorial health officials, DHHS can assist in providing subject matter expertise for a wide variety of medical intelligence issues. As the lead agency for emergency support function #8, DHHS, in turn, will receive valuable actionable intelligence in support of its mission. In addition, DHHS's operational assets will be able to plan, respond, and recover from various large-scale incidents with a greater sense of situational awareness and a common operating picture. DHHS, through its many operational divisions, conducts significant research and analysis in a wide variety of medical-related fields. Other federal agencies include, but are not limited to, the Department of Defense, the Department of Veteran's Affairs, United States Secret Service, United States Army Corps of Engineers, the Federal Bureau of Investigation, the Office of the Director of National Intelligence, the Central Intelligence Agency, the Environmental Protection Agency, the United States Capitol Police, and the Nuclear Regulatory Commission.

At state, local, tribal, and territorial levels are a number of agencies that would serve as key partners in ensuring the collection and dissemination of information. These include, but are not limited to, departments responsible for such functions as public health, epidemiology, laboratory services, animal control, radiation protection, occupational health, environmental health, emergency management, law enforcement, poison control, water authority, veterinary services, and state emergency medical services In addition, jurisdictions should include any existing or developing intelligence fusion centers in their medical intelligence operations.

C. ORGANIZATIONAL DESIGN

1. Key Staffing

In order for a domestic medical intelligence center to be effective, its key leadership must have access to decision makers at a wide variety of agencies. As

identified by the Hurricane Katrina After Action Report, one of the major debates surrounding the Federal Emergency Management Agency's preparedness and response capability in relation to Hurricane Katrina stemmed from the merger of the Federal Emergency Management Agency into the Department of Homeland Security.[30] Many believe this placed the agency too low in the hierarchy to be effective. Similarly, we must ensure that the same does not happen with a domestic medical intelligence center. While it does not necessarily have to be a cabinet level agency, access to key senior officials in a timely manner is essential. If one were to continue with the viable option of placing this center within the Department of Homeland Security, the position ideally would be located within the Department's Office of Health Affairs. Organizationally, there are a number of alternatives; however, the structure must be established in such a way as to limit the development of non-collaborative organizational units. A proposed organizational structure can be found in Figure 7.

[30]. A Failure of Initiative: The Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina (Washington, DC: The House of Representatives, February 2006), 151.

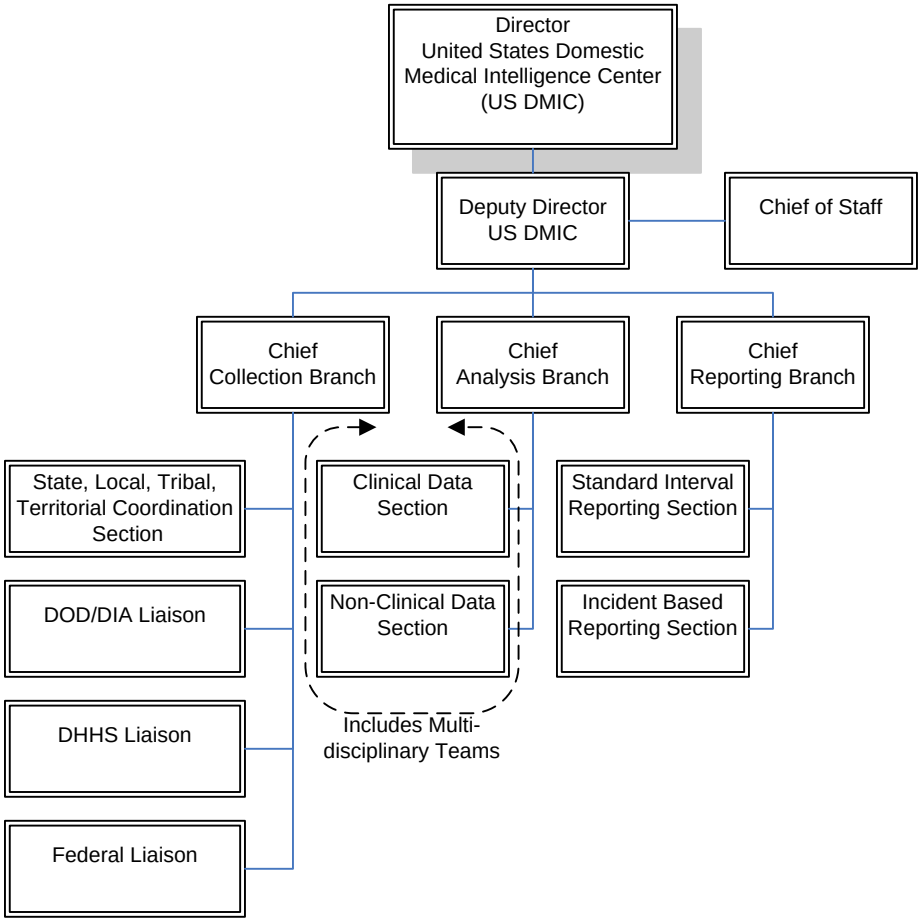

Figure 7. Proposed Domestic Medical Intelligence Center Organizational Chart.

D. ROLES AND RESPONSIBILITIES

1. Department of Health and Human Services

As one of the key partners in a domestic medical intelligence center, the Department of Health and Human Services (DHHS) plays an integral role in the collection and dissemination of information. In addition, it is in a position to provide subject matter expertise in a wide variety of medical specialties through its various operational divisions.

During the initial stages of development, DHHS can provide significant assistance by working toward establishing the preliminary data collection set, in addition to preparing potential data sources from which it already may receive data. DHHS, by design, has a large number of operational divisions that span a wide variety of specialties, from the Centers for Disease Control and Prevention to the National Institute of Health and the Food and Drug Administration. Each of these operations divisions interact frequently with its counterparts on a state and local level. These relationships would need to be identified and mapped out on a national level. This would help prevent the domestic medical intelligence center from placing multiple requests for the same data to state and local governments.

Once the center is operational, DHHS should assign at least one staff member, around the clock, to the domestic medical intelligence center to serve as a liaison to the Department of Health and Human Services Secretary's Operations Center and the various operational divisions within DHHS. These individuals would be able to reach back to DHHS for specific information not readily available within the center itself. In return, both the Secretary's Operations Center and emergency operations centers within the various operational divisions within DHHS would benefit from an increased level of situation awareness and would be integrated into the common operating picture.

DHHS, through its Office of Global Health Affairs, also would serve as a conduit, in conjunction with the Department of Homeland Security, for information-sharing with organizations such as the World Health Organization and other nations.

2. Department of Defense

The roles and responsibilities of the Department of Defense (DOD) will be based upon its current level of involvement with both general and medical intelligence matters. Entities such as the Armed Forces Medical Intelligence Center (AFMIC) most likely would be the most involved DOD entity, followed by the various medical commands of the different branches, along with the United States Northern Command.

These entities would be responsible for sharing existing information regarding potential global threats that pose a risk to the United States, in addition to assisting with information collection and dissemination in the event of response operations within the United States, such as a response to a natural or man-made disaster.

3. Other Federal Agencies

Other federal agencies, such as the Office of the Director of National Intelligence, the Environmental Protection Agency, and the Federal Bureau of Investigation, would serve as partner agencies in the collection and dissemination of information to their respective state and local partners. The key to a successful center would be the exploitation of existing data collection mechanisms. Each of these agencies collect and report on information throughout the nation on a regular basis. The input from these agencies in both the collection and dissemination of information is crucial. Ideally, we would utilize these existing mechanisms instead of developing new ones.

4. State, Local, Tribal, and Territorial Governments

State, local, tribal, and territorial (SLTT) governments would play a key role in the implementation of such a center. Without available data, the nationwide analysis is inaccurate and becomes increasingly useless. In addition, these various levels of government are instrumental in developing the appropriate reporting mechanisms to support their respective missions. The creation of reports that do not support the end user is useless. SLTT governments know what information they need and who they need to share it with to support their preparedness and response activities.

State, local, tribal, and territorial governments would be responsible for participating actively in the collection and reporting of information to their respective partners. While state and local governments cannot be mandated to participate, financial support through existing funding sources such as Department of Homeland Security grants and Department of Health and Human Services public health and health care grants could be utilized to help facilitate participation.

E. DATA COLLECTION/INFORMATION SHARING

There are a number of various data points that would need to be collected, collectively analyzed, and reported in order to be beneficial to federal, state, and local governments. Much of the data listed below currently is being collected at the state level and in some cases at the federal level. Table 2 provides a brief synopsis of the proposed data points, whether or not they currently are collected at the state and/or federal level, and whether or not they should be available before the center becomes operational (primary), during the initial years (secondary), and in outlying years (tertiary). While the table addresses whether or not the data is currently collected, one of the major gaps is the integration of this data from the various sources and the integrated analysis. While the collection may be taking place, the latter, in most cases, is not. In addition, the table addresses whether the data is predominantly detection-based, response-based, or both. While an abnormal occurrence in any one of these data points alone may not be a cause for alarm, a combination may. Currently, there is no method for a state or the federal government to assess abnormal occurrences collectively across all of these fields.

Data Set	Currently Collected	Priority	Detection/Response
Animal Control	Yes	Tertiary	Detection
Radiation	Yes	Primary	Detection
Nuclear	Yes	Primary	Detection
Disease Surveillance	Yes	Primary	Detection
Syndromic Surveillance	Yes	Primary	Detection
School Health Surveillance	Yes	Secondary	Detection
BioWatch	Yes	Primary	Detection

Federal Government Sensors	Yes	Primary	Detection/ Response
Department of Defense Sensors	Yes	Primary	Detection/ Response
Private Sector Sensors	Yes	Tertiary	Detection/ Response
Veterinary/zoological	Yes	Secondary	Detection
Agricultural data	No	Secondary	Detection
CDC Quarantine Station	Yes	Primary	Detection
Pre-hospital Care Diagnosis	Yes	Tertiary	Detection/ Response
Poison Control	Yes	Primary	Detection
Aeromedical Evacuation	No	Secondary	Detection/ Response
Water Testing	Yes	Secondary	Detection
Hospital Bed Status	Yes	Primary	Response
Hospital Critical Asset Survey	Yes	Tertiary	Response
Hospital Capabilities	No	Secondary	Response
BioSense	Yes	Primary	Detection
Nursing Home	No	Secondary	Detection
Air Sampling	Yes	Tertiary	Detection/ Response
Occupational Health	Yes	Tertiary	Detection/ Response
Background Illness Levels	Yes	Primary	Detection

Table 2. Domestic Medical Intelligence Center Data.

1. Animal Control Data

Animal control data provide a wide variety of beneficial information. In the event of a biological event, animals, both domesticated and non-domesticated, may serve as key indicators of a potential natural or man-made biological or chemical attack. In early January 2007, approximately 60 dead birds were found on the streets of Austin, Texas, around the Capitol. The discovery of these birds initially had the public fearing the worst, including the release of hazardous chemicals or some type of biological pathogen. However, it was discovered subsequently that the deaths were due to natural causes. Cases similar to this one have occurred throughout the nation. Data on the rates of animal illness in addition to suspicious death data may serve as indicators of potential domestic or international terrorist attacks.

Animal control data are collected and analyzed by a variety of organizations, including state, local, tribal, and territorial governments, animal shelters, the American Society for the Prevention of Cruelty to Animals, veterinarians, and other sources. Information reported should be analyzed to prevent the potential for duplicate data.

2. Radiation (Source Movement and Current Radiological Programs)

The movement of radioactive sources over the roads, waterways, and railways of the United States occurs on a daily basis. Also, radiation detectors are actively monitored on those same roadways, waterways, and railways. In addition to tracking the movement of radioactive sources throughout the jurisdiction, effective monitoring of the theft or potential theft of radioactive material is critical. An August 2003 report by the Government Accountability Office (then named the General Accounting Office) states that there have been more than 1,300 incidents of loss, theft, or abandonment of sealed radiological sources between 1998 and the time the report was published.[31] While the report states that a majority of the devices subsequently were recovered, this remains a cause of concern. The combination of acquisition of radiological sources through theft

[31]. Nuclear Security Federal and State Action Needed to Improve Security of Sealed Radioactive Sources (Washington, DC: General Accounting Office, August 2003), 4.

and the theft of explosives within the same jurisdiction or through a variety of sources may be an indicator of potential terrorist activity.

In addition, the identification of programs, hospitals, health care treatment centers, academic centers, construction companies, and other entities that may be utilizing, storing, or shipping radiological material is critical. In addition to identification, these entities should be involved in a collaborative manner to assist with the identification of stolen material or the potential black market trafficking of radioactive material.

Radiological data are collected by a number of difference agencies. Typically, at least one entity at the state level is responsible for the inspection of health care-based radiological programs. This may reside within the state public health agency or another agency, such as environmental health. In some jurisdictions, this information may be reported to the emergency management agency or the fire department.

3. Nuclear (Source Movement and Pertinent Nuclear Programs)

The movement of nuclear material throughout the United States is highly regulated and monitored by the Nuclear Regulatory Commission; however, many times such data are not shared with state and local governments. The movement of nuclear material should be monitored and tracked for the same purposes mentioned above for radioactive material.

In addition, the identification of programs, hospitals, health care treatment centers, academic centers, power plants, and other entities that may be utilizing, storing, or shipping nuclear material is critical. In addition to identification, these entities should be involved in a collaborative manner to assist with the identification of stolen material or the potential black market trafficking of radioactive material.

Nuclear data may be collected by the state public health agency, the state environmental health agency, or nuclear power plants within the jurisdiction.

4. Disease Surveillance Data

States throughout the nation either have developed or utilize commercial off-the-shelf disease surveillance systems. These data subsequently are uploaded into the Center for Disease Control and Prevention's National Electronic Disease Surveillance System (NEDSS). While disease surveillance data are helpful, there is a time delay between the time of reporting and the time of analysis. In addition, the reporting is based upon the clinical provider reporting data in a timely and accurate manner. The Centers for Disease Control and Prevention currently maintains a list of diseases that require mandatory reporting at the county, state, and federal levels. These diseases include:

- Acquired Immunodeficiency Syndrome (AIDS)
- Anthrax
- Arboviral neuroinvasive and non-neuroinvasive diseases (such as Eastern and Western equine encephalitis)
- Botulism
- Brucellosis
- Chancroid
- Chlamydia trachomatis, genital infections
- Cholera
- Coccidioidomycosis
- Cryptosporidiosis
- Cyclosporiasis
- Diphtheria
- Ehrlichiosis
- Giardiasis
- Gonorrhea
- Haemophilus influenzae, invasive disease
- Hansen disease (leprosy)
- Hantavirus pulmonary syndrome
- Hemolytic uremic syndrome, post-diarrheal
- Hepatitis, viral, acute
- Hepatitis, viral, chronic
- HIV infection
- Influenza-associated pediatric mortality
- Legionellosis
- Listeriosis
- Lyme disease
- Malaria
- Measles
- Meningococcal disease
- Mumps
- Novel influenza A virus infections
- Pertussis
- Plague
- Poliomyelitis, paralytic

- Poliovirus infection, nonparalytic
- Psittacosis
- Q Fever
- Rabies
- Rocky Mountain spotted fever
- Rubella
- Rubella, congenital syndrome
- Salmonellosis
- Severe Acute Respiratory Syndrome-associated Coronavirus (SARS-CoV)
- Shiga toxin-producing Escherichia coli (STEC)
- Shigellosis
- Smallpox
- Streptococcal disease, invasive, Group A
- Streptococcal toxic-shock syndrome
- *Streptococcus pneumoniae*, drug resistant, invasive disease
- *Streptococcus pneumoniae*, invasive in children <5 years
- Syphilis
- Syphilis, congenital
- Tetanus
- Toxic-shock syndrome (other than Streptococcal)
- Trichinellosis (Trichinosis)
- Tuberculosis
- Tularemia
- Typhoid fever
- Vancomycin - intermediate *Staphylococcus aureus* (VISA)
- Vancomycin - resistant *Staphylococcus aureus* (VRSA)
- Varicella (morbidity)
- Varicella (deaths only)
- Vibriosis
- Yellow fever

Disease surveillance data are collected from a wide variety of entities, including state and local public health departments, hospitals, clinics, pharmacies, and other health care entities. These data already are analyzed on local, state, and federal levels. The sharing of these data with a domestic medical intelligence center should be rather simple.

5. Syndromic Surveillance Data

Syndromic surveillance as defined by the Centers for Disease Control and Prevention is "surveillance using health-related data that precede diagnosis and signal a sufficient probability of a case or an outbreak to warrant further public health

response."[32] The system is predicated on the assumption that some disease outbreaks or acts of terrorism can be detected based on the symptoms that patients exhibit, as opposed to a formal diagnosis. The utilization of this method of surveillance allows information to be collected earlier in the diagnosis and treatment stages. In addition, it allows more rapid identification of potential hazards. While one often is unable to identify the specific pathogen or agent involved, it may be possible to rule out some and rule in others. This ability is key to determining whether the information at hand in an indicator or warning of a potential terrorist event. Typically, during day-to-day operations, these data are collected manually or electronically throughout the nation and analyzed by epidemiologists in the public, private, and military sectors. While these systems collect data from a wide variety of sources, including hospitals, poison control centers, primary care clinics, physician's offices, schools, and pharmacies, the data still require routine analysis and examination. Unfortunately, most data are collected and analyzed on a state level and in limited areas on a regional level; however, there currently is no national level analysis of syndromic surveillance data with the exception of the BioSense program.

While syndromic surveillance data are a key component to the medical intelligence function, one must not omit the other available sources of information.

Syndromic surveillance data, similar to disease surveillance data, are collected from a wide variety of entities, including state and local public health departments, hospitals, clinics, pharmacies, schools, and other health care sources. These data already are analyzed on local, state, and federal levels. The sharing of these data with a domestic medical intelligence center should be rather simple.

6. School Health Surveillance Data

Disease and syndromic surveillance data typically are collected from a wide variety of sources, including pharmacies, hospitals, physician's offices, and primary care clinics; however, emerging data sources include public, private, and charter schools. Children serve as reservoirs for a variety of diseases and many times are responsible for

[32]. Centers for Disease Control and Prevention, "Syndromic Surveillance: An Applied Approach to Outbreak Detection," http://www.cdc.gov/epo/dphsi/syndromic.htm (Accessed July 3, 2007).

transmitting diseases to either other children or parents and family at home. Recent technological advances allow for schools to report data either via web-based interfaces or touch-tone telephones. This allows schools and facilities that may not have Internet access readily accessible within their nurse's offices to submit data. Ideally, collection should be enhanced to include day care centers, pre-schools, and kindergarten programs. With the recent technological advances, even home-based day care centers could participate in data submission.

7. BioWatch Data

The BioWatch program, coordinated by the United States Department of Homeland Security, is a system of nationwide biological agent sensors. The program is operated by a number of partner agencies, including the Environmental Protection Agency, the Centers for Disease Control and Prevention, and local and state public health laboratories.

The Environmental Protection Agency's role includes the maintenance of the sensors that collect the airborne particles. After these airborne particles are collected, in most cases they are sent to state and local public health laboratories for testing. The Centers for Disease Control and Prevention assists with the coordination; however, the actual testing is conducted by local and state labs, which are members of the Center for Disease Control and Prevention's Laboratory Response Network.

The BioWatch Program, funded and overseen by DHS, has three main elements each coordinated by different agencies: sampling, analysis, and response. The Environmental Protection Agency (EPA) maintains the sampling component, the sensors that collect airborne particles. The Centers for Disease Control and Prevention (CDC) coordinates analysis, the laboratory testing of the samples, though testing actually is carried out in state and local public health laboratories. Local jurisdictions are responsible for the public health response to positive findings.

Jurisdictions that contain BioWatch sensors already have established alerting and response protocols to follow in the event of a BioWatch actionable result. The protocols

include both a state and local conference call and a national conference call. It would be ideal for the domestic medical intelligence center to participate on the national conference call.

8. Federal Government Sensor Data

Federal agencies throughout the nation maintain the capability to monitor and detect various chemical, biological, radiological, and explosive agents. Within the National Capital Region, sensors are maintained by a wide variety of agencies, including the United States Capitol Police, the United States Secret Service, and the Department of Homeland Security. While data are routinely collected and analyzed within each agency, there is no known central coordinating point for all of the data in its entirety.

Major metropolitan regions that maintain a large federal presence would benefit significantly from having consolidated reporting from all of the federal agencies involved. Unfortunately, most agencies, federal, state, and local, don't even know what sensors are currently out there, who owns them, and who receives notifications from these sensors when they are triggered.

A central database would need to be established with current sensors for all federal agencies. Data would include location, host agency, sensor type, reporting frequency, collection/sampling methodology, reporting entity, and other basic information.

9. Department of Defense Sensor Data

The Department of Defense maintains sensors that are able to detect a wide variety of chemical, biological, radiological, nuclear, and explosive material throughout the nation at a number of facilities throughout the nation. The Department of Defense Installation Protection Program, commonly referred to as Guardian, currently is managed by the United States Army. It has approximately 200 DOD-owned or leased facilities scheduled to participate by FY11. Guardian systems include a wide variety of programs, including detection, identification, warning, protection, decontamination, information

management, medical protection, surveillance and response.[33] While a significant amount of data are collected, there is little awareness on a state level of potential alarms or abnormal results.

10. Private Sector Sensor Data

While we have discussed sensor data collected by federal agencies and the Department of Defense, there are a large number of private commercial entities that maintain sensors throughout major metropolitan areas. Major corporations may lose significant amounts of money in the event of a natural, man-made, or technological disaster. While some rely on local first responders, others, such as private firms on Wall Street in New York City,[34] have taken matters into their own hands. Some even have gone so far as to develop intricate wireless sensor systems for radiation, toxic industrial chemical, and chemical warfare agents.[35] In addition, it is not uncommon to see larger companies maintain decontamination systems, shelter in-place supplies, and other systems in preparation for a wide variety of incidents.[36] The funds spent on these systems are negligible compared to the potential financial losses at stake. Unfortunately, in some cases, the local first responders are not even aware that they exist. While the federal government cannot force the private sector to share data, collaboration through entities such as the Government Coordinating Councils and Sector Coordinating Councils established for critical infrastructure can lead to a mutually beneficial relationship for medical intelligence.

Private sector data would ideally be collected through the city and/or state in which they reside. This would ensure that state and local governments are not excluded from any individual reporting streams. In the event that larger, multi-jurisdictional agencies wish to submit data on a regional or national level, the domestic medical intelligence center should share the data with the respective state and local governments.

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33. A-GRAM Installation Protection Program – Guardian (Tyndall AFB, Florida, June, 2005), 1.

34. New York Business Executive, interview by author, New York, New York, Spring 2005. Interview was conducted in confidence and the names of interviewees are withheld by mutual agreement.

35. Ibid.

36. Ibid.

11. Veterinary/Zoological Data

One significantly underutilized resource is the numerous partners who can assist us in collecting veterinary or zoological data. In addition to our nation's zoos, additional information regarding existing or emerging threats from the animal population may be identified by park rangers, animal control personnel, private sector kennels, veterinary schools, and wildlife associations. The use of a chemical or biological agent may result in the development of illnesses or deaths in our animal population prior to any signs and symptoms appearing among humans. Close collaboration with animal control personnel on a state and local level is crucial. In addition, accessibility to the expertise provided by zoo staffs from across the nation also would be beneficial. When facing a potential biological threat, some of the diseases may originate or affect animals.

12. Agricultural Data

Data from various agricultural resources on the local, state, and federal levels can help identify potential outbreaks of diseases that may not directly affect the human population. In addition to information from farms and ranches, information should be collected from the various processing and distribution facilities throughout the nation. Due to the significant amount of importation of food from around the globe, close coordination with public health organizations in other nations is vital. While humans may not be directly at risk, the global economic impacts from issues such as foot and mouth disease and avian influenza could be significant.

13. CDC Quarantine Station Data

The Centers for Disease Control and Prevention, through its Division of Global Migration and Quarantine, staffs 20 quarantine stations that are responsible for public health-related matters at seaports and airports throughout the nation, and some in Canada and the Caribbean. In addition to working routinely with agencies such as the Customs and Border Protection, Immigration and Customs Enforcement, the Food and Drug Administration, the United States Coast Guard, and a wide variety of federal, state, and local partners, they are routinely evaluating whether ill individuals can enter the United

States and how to prevent the spread of communicable diseases. Teams made up of medical officers and public health officials are the first line of defense at our nation's various points of entry. In addition, they respond to requests for medical attention aboard aircraft or maritime vessels, inspect animals, animal products, and human remains prior to entry, screen cargo and carry-on baggage for potential vectors that could carry communicable diseases, and provide travelers with health information.

14. Pre-hospital Care Diagnosis Data

Traditional syndromic and disease surveillance systems are based predominantly based in hospital, clinic, and other non-pre-hospital care sources. The collection of pre-hospital syndromic surveillance data is not a new phenomenon. Data collection has been conducted as far back as 1998 by jurisdictions such as New York City. New York City has been collecting ambulance dispatch data since as early as 1998. [37] While dispatch information may not always be accurate, in lieu of actual patient care data, dispatch data are a useful starting point. As the use of electronic patient care reporting expands throughout the nation, the integration of this data becomes easier.

Pre-hospital data should be collected through the various state and local governments and not directly from each agency.

15. Poison Control Data

According to the American Association of Poison Control Centers, the number of human exposure case records opened in 2004 (the latest data set available) has increased 3.7 percent since 2002 to 2,473,750, and the number of animal exposure case records in 2004 increased 8.5 percent to 141,205.[38] In addition, the average population size served by each poison control center also increased by almost 300,000. From a medical intelligence perspective, as more people are utilizing these centers, the potential exists

[37]. Nancy Greenko, "Clinical Evaluation of the Emergency Medical Services (EMS) Ambulance Dispatched-Based Syndromic Surveillance System, New York City," *Journal of Urban Health: Bulletin of the New York Academy of Medicine* 80, no. 2 supplement 1 (2003): i50.

[38]. American Association of Poison Control Centers, "2004 Poison Center Survey," http://www.aapcc.org/2004_poison_center_survey_results.htm (Accessed June 12, 2007).

that they may hold some of the vital clues related to the identification of a natural or man-made incident involving radiological, biological, or chemical agents. While some poison control centers are involved in local syndromic surveillance systems, many are not. The American Association of Poison Control Centers does maintain the National Poisoning and Exposure Database, but these currently are not integrated into existing public health systems, an issue that could be resolved by the development of a medical intelligence center.

16. Aeromedical Evacuation Data

Similar to pre-hospital care diagnosis data, information collected by aeromedical personnel may be useful to state and federal officials. Aeromedical services are in the unique position to deal with patients from a pre-hospital arena and during the transportation of patients between facilities. At times, due to the large geographic area served by most aeromedical services, syndromic surveillance data may not be integrated into existing systems. Some programs even are dispatched by personnel several states away. During large-scale events that span large geographic areas, aeromedical evacuation operations face challenges not seen in routine operations. In some cases, collaboration with law enforcement or other partner agencies may be necessary. Collaboration through a medical intelligence center may be helpful.

Aeromedical evacuation data should be collected through the various state and local governments, similar to pre-hospital care data.

17. Water Testing Data

Water testing throughout the nation is conducted by a wide variety of organizations. In areas of the nation that predominantly utilize well-based systems, water may go years or decades without being tested. In these cases, the contamination of water supply systems by intentional or unintentional means may go unnoticed for a number of years. While it would be impractical to expect all land owners with well-based systems to test their water on a regular basis, jurisdictions that currently conduct water testing need to integrate their results with local and state public health reporting systems.

Jurisdictions with private sector water testing entities should develop a collaborative mechanism in which the appropriate data can be shared.

In addition to private water testing data, municipal water systems undergo rigorous testing for a wide range of contaminants. Hopefully, any attempts to intentionally contaminate public water supplies would be identified through this testing. Testing information that may not appear to be terrorism-related but may be abnormal may go unnoticed if not integrated with other medical intelligence data.

The third, and one of the more vulnerable systems, is our bottled water industry. With the use of bottled water on the rise, the potential for contamination always is present. In addition, the amount of contaminant required to contaminate a bottle of water is significantly less than that needed to contaminate a well, reservoir, or public water supply.

A thorough analysis of these systems, along with others, can be facilitated through a medical intelligence center.

Water testing data can be collected from state and local governments, the United States Army Corps of Engineers, and private laboratories. Private laboratory data should be fed through their respective state and local governments.

18. Hospital Bed Status Data

The evaluation of hospital bed status has become the benchmark for assessing medical surge capacity. However, this is one benchmark that is changing consistently. The lack of a real-time bed status system forces states to rely on hospitals to self-report. Unfortunately, a hospital's bed status can change minute by minute while reporting typically is conducted only once every one to six hours. There are a number of factors that go into determining hospitals' current bed availability, the least of which are equipment related. Hospitals throughout the nation have empty beds available; however, they do not have the personnel to staff them. On an average day, emergency rooms around the nation are operating at or above capacity. They frequently hold patients who

are waiting to be admitted to beds throughout the facility. The assessment of bed availability one minute does not account for the rapid influx of patients from a non-related event five minutes later.

Another significant challenge in collecting and assessing bed data from multiple regions or states is a lack of consistency in terminology. For instance, when assessing neonatal bed capacity, are we referring to a level 1, 2, 3, or a regional neonatal intensive care unit? If we are assessing the current capacity for burn patients, do we survey facilities that have American Burn Association credentialed burn beds or those that are self-designated. The after action report from the Rhode Island Night Club Fire in 2003 discusses the need to further evaluate the transfer of all moderate and critically burned patients to American Burn Association accredited burn centers, as opposed to being held closer to home at local hospitals.[39] Even within the same state, terms may not be consistent hospital to hospital. For example, what is the true definition of a surgical intensive care unit? One hospital may have one while another may not; however, both may be fully capable of caring for a patient in a post-operative state.

The only true fix for this issue would be to develop a standardized set of definitions for hospital bed types throughout the nation. The Department of Homeland Security's National Incident Management System Integration Center has taken on the daunting task of resource-typing assets in a wide variety of categories throughout the nation; however, the typing of hospital assets has not been completed yet. The only medical assets to be resource-typed to date are National Disaster Medical System response teams. Nothing prevents similar resource typing from being conducted for hospitals beds, medical equipment, and clinical and non-clinical hospital personnel. In the interim, the best stopgap measure would be to utilize the bed categories as defined by the National Disaster Medical System, with the addition of more descript definitions of what each of the categories contains.

[39]. Rhode Island The Station Club Fire After-Action Report (Washington, DC, Department of Homeland Security, September 2004), E-45.

Hospital bed status data should be collected through the various state health departments. In addition, data submitted through the National Disaster Medical System can be utilized.

19. Hospital Critical Asset Survey

Unfortunately, the days of hospitals maintaining a weeks' worth of equipment and supplies are long gone. In today's world of just-in-time inventories, many hospitals maintain only enough supplies for one or two days. Some even depend on multiple deliveries in the same day to maintain an adequate par level. This makes the ability to assess current asset capabilities even more critical today than in years past.

Hospitals throughout the nation have conducted critical asset surveys of both staff and equipment over the last few years. Health departments on local and state levels have attempted to collect and analyze the data for potential shortfalls and surpluses that could affect the ability for that region to respond to and manage a large-scale event. One issue however, is the lack of consistency of that data across the nation. Some only conduct inventories of equipment assets, such as ventilators, rapid infusers, and intravenous pumps, while others include pharmaceuticals and still others include personnel. While this may assist in assessing the capabilities for that specific area, it makes a multi-state or national analysis extremely difficult. In addition, many state and local health departments have not been successful in collecting this information from a majority of their regions.

In addition, we must ensure that the completion of these surveys is not unduly burdensome to the facilities themselves. In the future, the development of an electronic system that is tied into the facilities inventory management system would be ideal. This would allow real-time assessments of current inventory levels without the requirement for facilities to enter data into some type of reporting system. At the same time, a common set of data points must be developed to allow for adequate consistency throughout the nation. While this concept is not going to be available in the near future, it can become possible as more and more health care facilities become more technologically integrated.

Ideally, these data would be collected from the various state health departments throughout the nation.

20. Hospital Capabilities

In addition to bed availability and critical asset surveys, there currently is no single repository of hospital capabilities in the nation. While independent organizations such as the American College of Surgeons maintain lists of organizations that have chosen to meet its standards and guidelines for designation as trauma centers, there is no single, overall data repository of the wide variety of other specialties. Making this more difficult is the lack of consistent definition as to what constitutes the various levels or capabilities throughout the wide spectrum of medicine. As we have seen at a number of man-made and natural disasters over the last decade, the need to share medical resources and personnel is critical. Appropriate allocation and assessments of needs can be successful only if all of the appropriate information is available. Currently, teams with the National Disaster Medical System deploy throughout the nation to a wide variety of disasters; however, once they arrive, there is little to no information available as to the capabilities of hospitals throughout their area of operations. The development of a national dataset of hospital capabilities, along with a standardized set of definitions and a method of maintenance, is essential.

Hospital capabilities to assess include, but are not limited to:

Medical Services

- Allergy and immunology
- Cardiology
- Dentistry
- Dermatology
- Diving medicine
    - Hyperbaric chamber capabilities
- Emergency medicine
    - 24-hour full-time physicians
    - 24-hour on-call physicians
    - 24-hour full-time nurses
- Endocrinology
- Epidemiology
- Gastroenterology
- General medicine/family practice

- Hematology
- Infectious disease
- Internal medicine
- Nephrology
- Nuclear medicine
    - In-vivo capabilities
    - In-vitro capabilities
- Occupational medicine
- Oncology
- Pediatrics
- Physical medicine and rehabilitation
- Preventive medicine
- Psychiatry
- Pulmonology
- Public health Surgical Services
- Anesthesiology
- Cardiovascular surgery
- Ear, nose, and throat (ENT)
- General surgery (abdominal, chest, head)
- Neurosurgery
- Obstetrics/gynecology (OB/GYN)
- Ophthalmology
- Orthopedic surgery
- Pediatric surgery
- Plastic surgery (including burn care)
- Podiatry
- Proctology
- Stomatology (oral surgery)
- Thoracic surgery
- Trauma surgery
- Urology

Ancillary Services

- Blood banks
- Intensive care units
    - Burn unit
    - Cardiac care unit
    - Cardiac surgery unit
    - Neonatal unit
    - Neurology unit
    - Pediatric unit
    - Surgical unit
    - Trauma unit
    - Nephrology unit (dialysis)
- Laboratory
    - Chemistry
    - Hematology
    - Histology
    - Microbiology
    - Urinalysis
- Optometry
- Pharmacy
- X-ray
- Physical therapy
- Respiratory therapy

- Nutrition
- Pathology
- Toxicology
- Radiology
    - Computerized tomography (CT)
    - Magnetic resonance imaging (MRI)
    - Ultrasound
    - Flouroscopy

Miscellaneous Data

- Ownership (public, private, or military)
- Language capabilities
- Helipad capabilities
    - Landing zone size
    - Landing zone type
    - Fuel availability
    - Radio communications
- Backup power supply
    - Type
    - Size
    - Fuel on hand
- Medical gas storage
    - Type
    - Quantity
- Loading dock capabilities

While this is a significant amount of data, it can be collected and organized over a period of time. Of prime importance are the data related to emergency medical care, such as emergency department capabilities, blood band services, helipad capabilities, and surgical and intensive care capabilities. This can be followed by the remaining in-patient data and additional ancillary services.

One of the key challenges will consist of the definition of each of the data fields and the validation of the data submitted. Much of the data already should be available from state and local health departments. Other data, specifically trauma and burn data, can be collected from various professional associations. More difficult and detailed information will have to be collected via various surveys and subsequently validated by local, state, or federal partners.

21. BioSense Data

As reported by the Centers for Disease Control and Prevention, the BioSense program is a "national program intended to improve the nation's capabilities for conducting near real-time biosurveillance, enabling health situational awareness through access to existing data from health care organizations across the country. The primary objective is to expedite event recognition and response coordination among federal, state, and local public health and health care organizations by providing each level of public health access to the same data, at the same time."[40]

There currently is a significant amount of controversy surrounding this system, as it allows for data within a jurisdiction to be reported directly to the federal government, prior to analysis or assessment by the local or state public health department. Despite this, the Centers for Disease Control and Prevention is working diligently to recruit new facilities to serve as partners in this nationwide initiative. The program allows hospitals, clinics, commercial laboratories, poison control centers, and other health care partners to submit data electronically into the Centers for Disease Control and Prevention's electronic surveillance system.

However, this system has met a significant amount of resistance from both state and local health departments as it circumvents existing systems and excludes agencies currently partnered with health departments in their state and local initiatives.

BioSense data provides one aspect of disease and syndromic surveillance. It should not, and cannot, be utilized as the sole source of epidemiological information. It should be utilized with local and state data in addition to other existing systems, such as the Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE), utilized by the Department of Defense and several states throughout the nation. The key to a successful epidemiological system is integration with state and local government partners.

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[40]. Centers for Disease Control and Prevention, "BioSense," http://www.cdc.gov/biosense/ (Accessed June 17, 2007).

22. Nursing Home Incident Data

Despite the continuous outreach and expansion of syndromic and disease surveillance systems, one population that is a relative newcomer is nursing and long-term care facilities. Facilities in this category include a wide variety of institutions from assisted living communities to centers for patients who are mobility impaired or ventilator dependent. As the population of nursing and long-term care centers throughout the nation continues to increase, the inclusion of these centers in syndromic and disease surveillance systems is essential. In addition, patients who are more susceptible to various illnesses may serve as initial indicators of a newly emerging man-made or naturally occurring biological threat.

Nursing home data should be collected through the state level agency responsible for the licensing of those facilities.

23. Air Sampling Data

Air samples are collected by a wide variety of agencies throughout the nation for various purposes, including, but not limited to, sensing for chemical, biological, and radiological material, sampling for pollutants, and hazardous compounds. Analysis of this data in a silo may allow some abnormal readings to be dismissed as opposed to being analyzed as part of the bigger picture.

Air sample data can be collected by a wide variety of agencies including, but not limited to, state environmental health agencies, federal partners such as the Environmental Protection Agency, and private industry partners.

24. Occupational Health Data

Occupational health personnel are in the unique position of assisting prior to and after an incident. Prior to an incident, occupational health professionals may assist with disease and syndromic surveillance; however, the inclusion of occupational health professionals in syndromic and disease surveillance systems and preparedness initiatives has been less than optimal in prior years. In addition, they may assist with fit testing of

personal protective equipment, medical pre-screening for prophylaxis or treatment of various biological agents, and other activities. In the event of an exposure to a chemical, biological, or radiological agent, both in and out of the workplace, occupational health professionals may be the first to interact with the patients or may assist with the dispensing of pharmacological interventions.

Occupational health data can be collected by local and state health departments, state labor or employment agencies, and federal partners such as the Department of Labor and the Occupational Health and Safety Administration. In addition, larger occupational health organizations such as Federal Occupational Health and occupational health professional associations also may be helpful sources.

25. Background Illness Levels

The only way to effectively determine whether or not there has been a potential chemical, biological, or radiological incident is to determine current background levels. Whether we are discussing radiation levels or syndromic surveillance, we must have a thorough understanding of our baseline. Key partners in determining these baselines are emergency medical service agencies throughout the nation. Historically, since a significant majority of emergency medical services agencies are either commercial or volunteer-based, they have not participated actively in syndromic surveillance or patient presentation reporting systems; however, their assessment of both call volume and type is vital to an appropriate and thorough assessment.

26. Classified Data Sources

State governments, more so than local, territorial, and tribal nations, will need to develop the ability to share classified data. While this ability will need to expand and evolve over time, this should not prohibit a jurisdiction from sending or receiving data to or from a domestic medical intelligence center. The quantity of classified reports within this sector should be minimal. With the exception of some research and development information, medical countermeasures capabilities, federal/international operations, and threat assessments or reports, a majority of the documentation should be available at “for

official use only" or other sensitive but unclassified levels. This will involve a significant shift from our current operations. Traditionally, security clearances within state governments are held within law enforcement agencies, homeland security agencies, and key elected officials. Over the past few years, state public health officials in some jurisdictions also have been able to obtain security clearances; however, the methods of obtaining those clearances vary state by state. State governments will have to expand their current capabilities to access, store, disseminate, and communicate classified information by expanding current information security and communications security operations. Key agency personnel in departments that may not have been involved in these types of operations will need to obtain security clearances. Policies and procedures must be put into place regarding the management and handling of classified information within and among state level agencies. Local, territorial, and tribal nations, based on size, geographic location, and need, also may have to take similar steps.

From a federal perspective, barriers that traditionally have withheld classified information from state governments must be broken down. Unfortunately, in the past, information has been withheld for one of two primary reasons, fear of information being disseminated to unapproved personnel, including the media, and the need to protect intelligence sources and methods of collection. Anecdotally, most references in newspapers in regard to unnamed sources for sensitive information are traditionally at the federal level, not among state and local government. In regard to the second issue, with very little exception, the vast majority of state, local, territorial, and tribal nations do not require access to sources and methods. They are irrelevant to their operations. Essentially, we have sacrificed the sharing of all information for the protection of information that does not need to be shared.

Precedent already has been set for this type of information-sharing outside of law enforcement. Within the critical infrastructure program, lead federal agencies for the seventeen critical infrastructure sectors, in conjunction with the Department of Homeland Security, not only have begun sharing classified information with state and local governments, but also with the private sector. In order to accomplish this, they have

worked with their partners to obtain security clearances for key personnel and advised their partners on the necessary measures that must be taken prior to sharing such information.

F. REPORT DISSEMINATION

Reporting typically falls into two categories, standard interval reporting and incident based reporting. The reporting can be provided by a wide variety of methods, including direct briefings, written reports, or web-based reporting. Typically, reports will be provided via multiple mediums to ensure the widest possible dissemination. We must ensure that all appropriate parties have the ability to receive and safely store the information as required, based on the level of data classification.

Reporting always must be accomplished with the end user in mind. Reports that are unorganized or do not meet the needs of the customer are a significant waste of limited resources. As is the case throughout the intelligence community, we must ensure that any reports generated are not subject to politicization and include careful analysis and not just clips from other reports. In addition, reports must contain actionable intelligence. It is not useful to provide raw, unanalyzed data to state and local governments that do not have the staff or expertise to extrapolate relevant information.

In the case of a domestic medical intelligence center, I propose that a few mediums be utilized to deliver information effectively to the end user, including the establishment of a secure, unclassified web site similar to the one currently utilized by the Armed Forces Medical Intelligence Center. In addition, classified web sites on the secret Internet protocol router network (SIPRNET), and the Joint Worldwide Intelligence Communications System (JWICS) could be added as the need arises in the future. Also, as regular assessments and reports are received, they should be disseminated to state, local, tribal, and territorial health departments throughout the nation. This may be facilitated by partnering with professional associations such as the Association of State and Territorial Health Officials and the National Association of County and City Health Officials.

1. Standard Interval Reporting

These reports, similar to daily intelligence updates or law enforcement watch reports, would be provided on a daily basis and would include classified and unclassified information from both international and domestic sources. Any significant closures, incidents, or changes from standard operations would be reported. Over the past few years, there have been reports of individuals pretending to be inspectors and other suspicious activity surrounding hospitals and health care facilities; however, that information appears to reach more law enforcement then health care agencies. This type of reporting would allow information to reach health care partners on federal, state, and local levels.

A key component of the report dissemination is to ensure inclusion of both private sector and public sector partners. Relationships established by the Government Coordinating Council and the Sector Coordinating Council will be instrumental in ensuring that reports reach all of the appropriate entities. State and local governments with the appropriate security clearances, information security programs, and communications security equipment and procedures also should receive all appropriate reports in a timely manner.

2. Incident Based Reporting

Incident based reporting would be similar to standard interval reporting; however, the information presented would be geared toward the incident at hand. The data collected and reporting methods would be different and dictated by the incident at hand. In addition, incident-based reporting would include tailored research based upon the information available at the time of the report. In the event of an international incident, coordination with the Centers for Disease Control and Prevention's Division of Global Migration and Quarantine, the Department of Health and Human Service Office of Global Health Affairs, the Department of State, and foreign governments is critical. Relationships with non-traditional partners can be facilitated by the operational divisions within the Department of Health and Human Services and the Department of Homeland Security that routinely deal with international issues.

G. SUMMARY

The development of a single, nationwide domestic medical intelligence center will not be without its challenges. However, continuing with the existing model of non-standardized, non-integrated, non-inclusive domestic medical intelligence is not a reasonable option.

As previously discussed, of the current potential locations for such a center, the best available option is the United States Department of Homeland Security. While the center would be housed with the Department of Homeland Security, it must have an extremely close working relationship with a number of agencies both horizontally and vertically. The United States Department of Health and Human Services (HHS)will have to be intimately involved in many aspects of the operation. In addition, HHS will be able to provide the subject matter expertise across the health care and public health sector to address any technical issues. Other federal partners, such as the Federal Bureau of Investigation, the Environmental Protection Agency, and the United States Department of Defense, will have to establish additional relationships with state, local, tribal, and territorial partners throughout the nation, in addition to international partners such as the World Health Organization. The support of professional organizations, such as the Association of State and Territorial Health Officials, the National Association of County and City Health Officials, the Council of State and Territorial Epidemiologists, and the American Public Health Association also can assist in garnering support both vertically and horizontally. All of these entities will be crucial in both the collection and dissemination of information to all appropriate organizations throughout the nation and internationally.

Even prior to the development of the operational relationships, assessments must be completed to ensure that all appropriate parties are approached before the formal proposal. In addition, one additional critical partner that could decide the fate of such a center is the Congress. While the President has the authority to create agencies on his

own, such as the National Security Agency and the Peace Corps,[41] as do his political appointees as seen with Defense Intelligence Agency and the Bureau of Alcohol, Tobacco, and Firearms,[42] the ideal method would be to follow the traditional route through the Congress, as these agencies tend to have stronger financial support and have almost as much access to the President as those created by the President himself.[43] In addition to Congressional support, support from each of the respective Secretaries of the Cabinet level agencies and Directors of the independent agencies is crucial. Many of these relationships already exist; others need to be fostered, and others need to be developed.

Once the relationships have been determined and established, there must be an analysis and determination of a common data set. These data, as described earlier, should be divided into three categories: data that would be needed prior to opening a domestic medical intelligence center; data that should be collected within the first couple of years; and data that should be added once the center has an established track record. Typically, clinical data that are readily available and already reported on a state and federal level would come first. This would be followed by data that are currently collected but not routinely shared, and lastly data that are not currently collected or shared. While some of the data may not be integrated into the system for a number of years, much of the data require the design and establishment of systems that would have to begin sooner rather than later. The key goal is to provide integrated, analyzed, synthesized, actionable intelligence to the end user.

The framework presented here is only the beginning of a long and complicated, but not complex, series of steps that would need to be followed to establish a domestic medical intelligence center. In addition, a thorough analysis of potential costs associated

41. William Howell and David Lewis, "Agencies by Presidential Design," *The Journal of Politics* 64, no. 4 (November 2002): 1097.

42. Ibid., 1097.

43. Ibid., 1098.

with the development and operations of the center would need to be completed, along with any budget impacts on both the host agency and its numerous federal, state, local, tribal, and territorial partners.

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V. CONCLUSION

A. SUMMARY

While the intelligence community has evolved over the last century, the field of medical intelligence is relatively new, and domestic medical intelligence is essentially an infant. The Department of Defense currently has a well established medical intelligence operation, through the Defense Intelligence Agency's Armed Forces Medical Intelligence Center, but no such center exists for domestic medical intelligence. In addition, existing fusion centers do not analyze the entire spectrum of medical intelligence, but only a small component of the existing available data.

During an Intelligence Advisory Committee meeting on March 22, 1949, Colonel Charles Blakeney of the Central Intelligence Agency defined medical intelligence as "the distribution and character of disease as they may influence planned operations, domestic affairs, or the national security, but also the climatologic, psychological, and physiologic intelligence as it bears upon the interrelationships between man, his environment, equipment and tasks."[44] Despite the focus on medical intelligence operations on nations outside the United States, this definition easily could be adapted for utilization within the United States. As mentioned earlier, I propose that we define domestic medical intelligence as that category of intelligence resulting from the collection, integration, analysis, and dissemination of natural and man-made psychological, chemical, biological, radiological, environmental, and agricultural information with a public health and health care focus that may influence the day-to-day activities or national security of the nation or national assets.

The system as it exists now leaves a significant void that affects not only the federal government, but state and local responders as well (see Figure 8). The analysis of medical intelligence alone leads to a high level of situational awareness of topics such as disease, syndromic, environmental, and zoonotic surveillance, and a low level of

awareness of general CBRNE and hazmat issues and threat assessments. The analysis of traditional law enforcement and fire department intelligence alone leads to the converse; however, integrated analysis leads to a much better overall awareness of a wide variety of potential hazards. The development of a domestic medical intelligence center would help fill that void.

As we have seen, there is little to no formal academic research into the field of domestic medical intelligence. This, combined with the lack of a formal federal driving force, is leading to jurisdictions developing medical intelligence systems based on their own definitions of what medical intelligence should comprise. As we have seen in the examples provided, the federal government, Department of Defense, and two local fusion centers seem to cover the spectrum in regard to the breadth of data collection, analysis, and dissemination of medical intelligence. A majority of the fusion centers, with the Metropolitan Washington Fusion Center being one of a few exceptions, focus a vast majority of their efforts solely or primarily on syndromic or disease surveillance. While this is an important component of domestic medical intelligence, it should not be the sole source. A nationwide standard must be established in order to maintain an organized, rapid, and efficient response to naturally occurring or man-made health care and public health risks.

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44. Jonathan Clemente, "The Fate of an Orphan: The Hawley Board and the Debates over the Postwar Organization of Medical Intelligence," *Intelligence and National Security* 20, no. 2 (June 2005): 279.

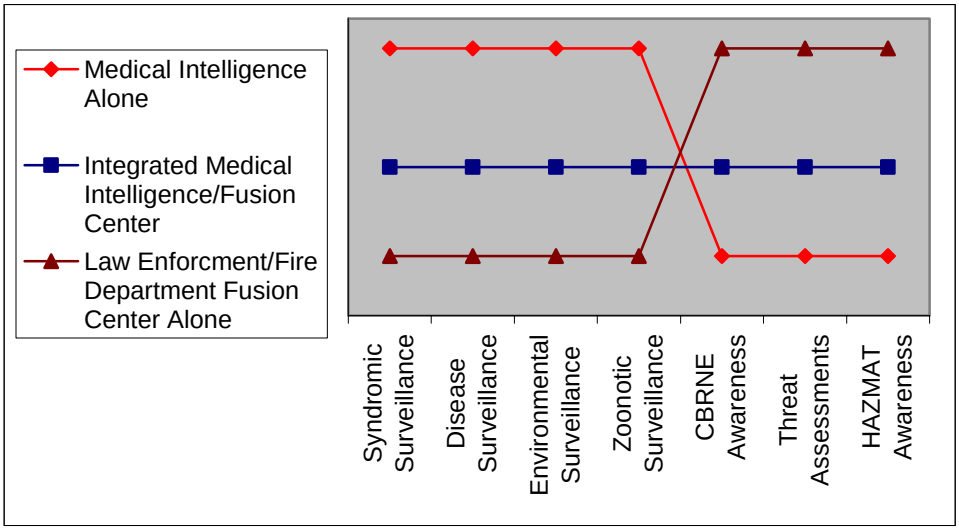

Figure 8. Domestic Medical Intelligence Center Strategy Canvas.

The need to fill this void will only increase in the years to come as the potential threat from a man-made, or naturally occurring biological agents, continues to resurface. The creation of a domestic medical intelligence center, as proposed, will help address some of those voids by providing integrated, synthesized, and analyzed actionable intelligence to the end user. Such a center, located within the Department of Homeland Security, that establishes close relationships with the Department of Health and Human Services and various federal, state, local, tribal, and territorial agencies, will allow for much greater situational awareness of domestic medical intelligence matters.

B. RECOMMENDATION FOR FUTURE RESEARCH

Domestic medical intelligence is a field with little formal or even informal evidence-based research. Due to the limited existing academic research, it is recommended that additional formal research be conducted on a number of aspects of domestic medical intelligence, including public reaction to medical intelligence collection, the establishment and implementation of a domestic medical intelligence center, the financial impacts of a domestic medical intelligence center on federal, state, local, tribal, and territorial governments, and a more in-depth evaluation of legislative

barriers on state, territorial, tribal, and national levels. As the medical intelligence field, and intelligence in general, continues to change and evolve, additional academic research and analysis will be required to ensure that the changes being made are in fact moving the field forward in the proper direction.

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